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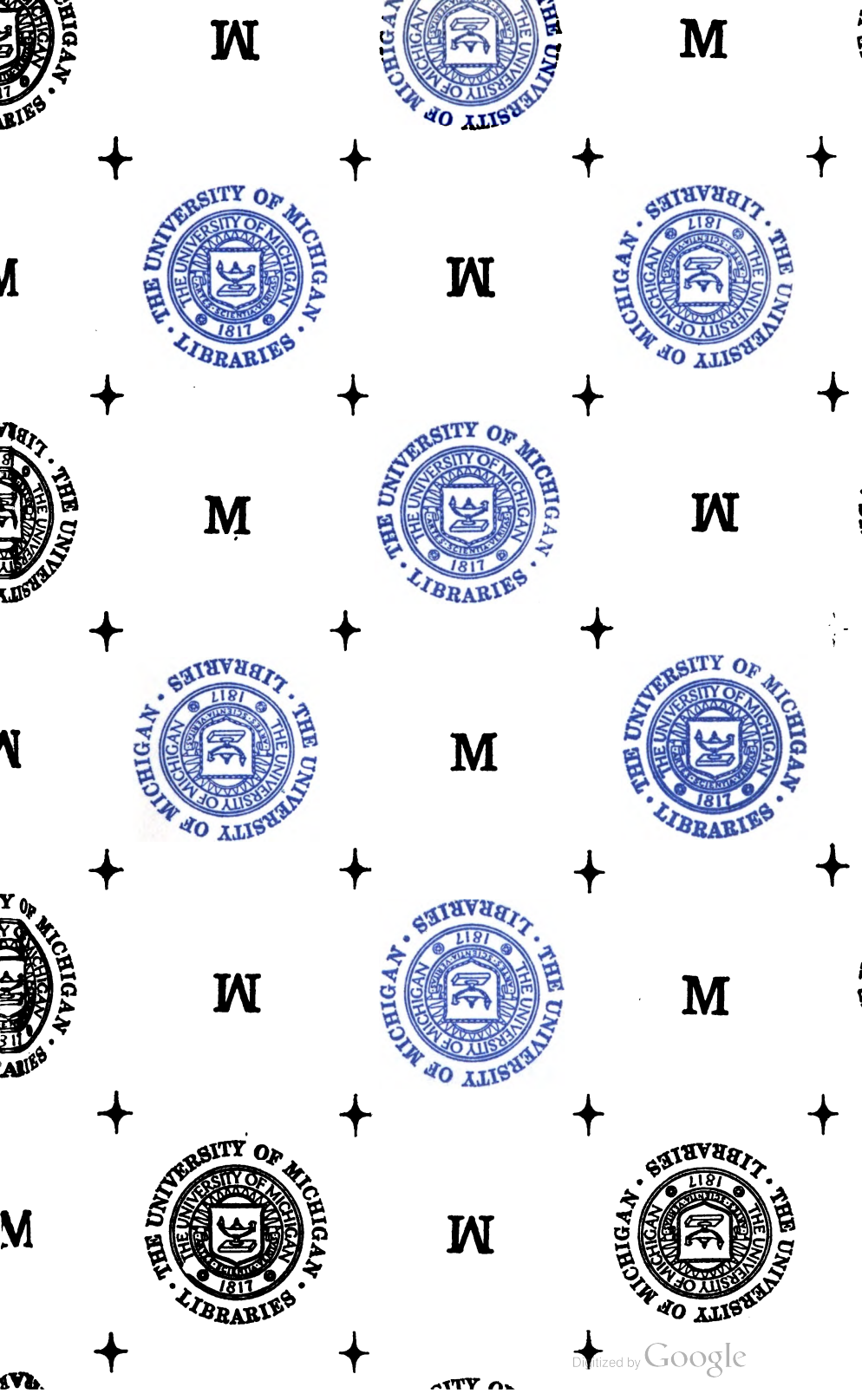


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THE
PHYTOLOGIST:
A
POPULAR
BOTANICAL MISCELLANY,

CONDUCTED BY
EDWARD NEWMAN, F.L.S., MEMB. IMP. L.-C. ACAD.

VOLUME THE FOURTH.
(CONCLUDED).



LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LIII.

NAT. SCI.

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Ye field flowers ! the gardens eclipse you, 'tis true,
Yet, wildings of Nature, I doat upon you,
For ye waft me to summers of old,
When the earth teem'd around me with fairy delight,
And when daisies and buttercups gladdened my sight,
Like treasures of silver and gold.

CAMPBELL.

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ADVERTISEMENT.

'THE PHYTOLOGIST' will be continued both as a monthly and an annual publication. As a monthly, it will contain thirty-two pages of letter-press, occasionally accompanied with figures of New British Plants; it will be on sale two days before the end of every month; and will be charged one shilling. As an annual it will be sold on or about the 1st of December; will contain twelve monthly numbers, bound and lettered uniformly with the present volume; and will be charged thirteen shillings. An alphabetical list of Contributors is published once in the year.

THE PHYTOLOGIST

FOR 1853.

Notes on the Rarer Plants occurring in the Neighbourhood of the Estuary of the Taw and Torridge, North Devon. By GEORGE MAW, Esq.

PERHAPS a list of the rarer plants growing in the neighbourhood of the estuary of the Taw and Torridge, may not be unacceptable to those of your readers who may occasionally vary their botanical rambles by an excursion to some locality distant from their own neighbourhood. To such, I can strongly recommend the north-west coast of Devon for a week's sojourn. I know of few districts that would better repay a little careful examination, or where such a variety of our rarer species occur within a comparatively small compass.

In describing the Flora of any district, I think it well that its limits should be defined rather by natural peculiarities than mere arbitrary measurements; and therefore, before enumerating the plants, I shall give a slight sketch of the principal geographical and geological features which characterize the locality under consideration as a *natural district*. It may be divided into two portions: firstly, that consisting of the post-tertiary or alluvial deposits, partially filling up the valley of the estuary; secondly, the higher land of the secondary formations surrounding it. The flat alluvial country has a coast-line along Barnstaple Bay, of seven or eight miles, and extends inland at this width for about three miles; after which, it gradually narrows up to Barnstaple, where, at seven miles from the sea, it terminates. The Taw, running from Barnstaple, in a westerly direction, unequally divides it into two portions, that to the north of the river (of which Braunton Burrows form a part) being the most extensive. The Torridge, flowing from Bideford towards the north, sub-divides the southern portion into Northam Burrows on the west bank, and Instow Burrows

on the east side of the river. Braunton Burrows is a district of sand-hills, about four or five miles in length, skirting the coast from the north bank of the estuary to a raised beach, which forms part of the northern boundary of Barnstaple Bay. They extend inland from two miles to two miles and a half, when they gradually merge into the flat marsh which occupies the remainder of the valley. The sand-hills vary from ten to thirty or forty feet in height, and are continually receiving fresh accumulations of sand from the sea, which renders them, immediately on the coast, almost devoid of vegetation. *Ammophila arundinacea* is here almost the only plant that survives the repeated interments; and by the aid of its fast-growing stolons, which readily penetrate the loose sand, it easily re-establishes itself on the surface, even when buried at a considerable depth. Vegetation gradually improves as we recede from the coast, and is richest on the inland boundary of the sand-hills, where they are intersected by several moist, flat valleys. These are the habitats of some of the most interesting plants of the district; amongst which, *Scirpus Holoschoenus*, *Bartsia viscosa*, and *Teucrium Scordium* stand foremost in point of rarity. The marsh-land to the east of the sand-hills is partially under cultivation; but the greater part is unenclosed, and covered with a maritime vegetation. The most prevalent plants here are *Juncus maritimus* and *J. acutus*. The latter attains a great height, many tufts being considerably taller than a man.

Northam Burrows consist of a salt-marsh, about 800 acres in extent, bounded on the west by the sea, and on the north and east by a narrow belt of sand-hills, which separates it from the estuary. Extending from the cliffs on the south side of the bay to the mouth of the river, is a high bank of boulders, known as Northam Pebble-ridge, which protects the marsh from the inroads of the sea.

Instow Burrows are situated on the east bank of the Torridge, at its confluence with the Taw. They are less extensive than either Northam or Braunton Burrows, and consist of a small range of sand-hills skirting the rivers, which, further inland, give place to an unreclaimed marsh, similar to that on the opposite shore.

The higher land to the south of the alluvial valley is situated at the northern extremity of the barren carboniferous beds of Devon. They consist of highly contorted beds of gritstone and shale, thrown into long, rounded hills, running east and west, the anticlinal areas of the strata being in that direction.

The barren carboniferous strata are bounded on the north by beds of a dark gray limestone, interstratified with a compact slaty rock,

and separated by them from the metalliferous slates, of more ancient date, which occur to the north of the valley.

Besides the lower secondary formations of the neighbourhood, a small outlier of the green sand caps a hill about two miles and a half to the south-west of Bideford; and the lower new red sandstone, entering on the carboniferous girts, forms a low cliff, for about half a mile along the coast at Peppercombe, a small village, at the south-eastern extremity of Barnstaple Bay.

In enumerating the plants of the district, I shall consider them under two heads: firstly, those occurring in the low alluvial valley, with which will be included most of the maritime species; secondly, those growing on the higher land in the immediate neighbourhood.

Plants of the Alluvial District.

Ranunculus Flammula, L., *β. reptans*, Lightf. Moist spots between the sand-hills of Branton Burrows.

Glaucium luteum, Scop. Near the raised beach of the north extremity of Branton Burrows; Instow Burrow.

Cakile maritima, Scop. Near the larger light-house, Branton Burrows; west bank of the Torridge, a short distance below Bideford.

Cochlearia Anglica, L. Banks of the Torridge, near Bideford.

Matthiola sinuata, Br. Raised beach to the north of Branton Burrows.

Reseda lutea, L. Sand-hills of Branton Burrows.

Viola lutea, Huds., *β. Curtisii*, Forst. Branton and Instow Burrows, invariably with *yellow flowers*. In specimens I received from New Brighton, Cheshire, through the Botanical Society, the flowers are all purple, and the plant appears to be of much stronger habit. Is it probable that the two plants are distinct; or are these differences merely the result of a difference of soil or situation?

Saponaria officinalis, L. Instow Burrows, close to the Barnstaple road; also by the road-side within the fence.

Saponaria officinalis, L., *flore pleno*. Near the light-house, Branton Burrows, probably introduced.

Sagina nodosa, Mey. Northam and Branton Burrows.

Spergularia marina, Camb. Salt-marshes on the banks of the Torridge.

Spergularia media. Southcott Marsh, near Bideford.

Radiola Millegrana, Sm. Sandy pasture of Northam Burrows.

Erodium maritimum, Sm. Sand-hills of Branton Burrows, and sandy pasture near the pebble-ridge, Northam Burrows.

Erodium cicutarium, Sm. Braunton and Northam Burrows.

Erodium cicutarium, *album*. Braunton Burrows.

Hydrocotyle vulgaris, L. Moist parts of Northam and Braunton Burrows.

Eryngium maritimum, L. Near the pebble-ridge, Northam Burrows ; Instow Burrows.

Oenanthe Lachenalii, Gmel. Moist pasture of Northam Burrows ; reclaimed salt-marsh between Bideford and Instow.

Artemisia maritima, L. Banks of the Torridge, below Bideford.

Artemisia maritima, L., *β. Gallica*, Willd. Banks of the Torridge, below Bideford, growing with *A. maritima*.

Erigeron acris, L. Braunton Burrows.

Aster Tripolium, L., var. destitute of rays. Muddy banks of the Torridge, above and below Bideford. This variety also differs from the ordinary form in never growing more than from six inches to a foot in height.

Vinca major, L. Near the light-house, Braunton Burrows, but not wild.

Gentiana Amarella, L. Braunton Burrows.

Erythræa littoralis, Hook. Braunton Burrows.

Convolvulus Soldanella, L. Sand-hills near the light-house, Braunton Burrows.

Hyoscyamus niger, L. Grows from three to four feet high on the sand-hills of Braunton Burrows ; Northam Burrows.

Solanum nigrum, L. Braunton and Northam Burrows.

Atropa Belladonna, L. Reported to grow at the north end of Braunton Burrows. I have never found it there.

Bartsia viscosa, L. Braunton Burrows, north-east of the light-house.

Orobanche minor, Sutt. Braunton Burrows.

Thymus Serpyllum, L. Dry pasture of Northam Burrows.

Teucrium Scordium, L. Plentiful in the moist parts of Braunton Burrows.

Marrubium vulgare, L. Braunton Burrows.

Lithospermum officinale, L. Braunton Burrows.

Lycopsis arvensis, L. Braunton Burrows.

Cynoglossum officinale, L. Braunton Burrows.

Echium vulgare, L. Braunton and Northam Burrows.

Anagallis tenella, L. Braunton and Northam Burrows.

Samolus Valerandi, L. Northam and Braunton Burrows.

Glaux maritima, L. Salt-marshes on the banks of the Taw and Torridge; Northam and Braunton Burrows.

Statice Limonium, L. Muddy banks of the river Torridge.

Statice spathulata. Raised bank, formed of agglutinated calcareous sand, at Down End, near the western extremity of Braunton Burrows.

Plantago maritima, L. East bank of the Torridge, below Bideford; Northam Burrows.

Littorella lacustris, L. Moist parts of Northam Burrows.

Chenopodium rubrum, L. Braunton Burrows.

Atriplex portulacoides, L. Muddy banks of the river Torridge.

Atriplex rosea, L. Banks of the Torridge.

Beta maritima, L. Muddy banks of the Torridge, below Bideford.

Salsola Kali, L. West bank of the Torridge, below Bideford Quay; near the light-house, Braunton Burrows, in great abundance.

Schoberia maritima, Mey. Muddy banks of the Torridge, above and below Bideford, in great abundance; banks of the Taw.

Salicornia herbacea, L. Banks of the Taw and Torridge, growing with *Schoberia maritima*.

Polygonum Rati, Bab. Sea-coast about half a mile to the north of Peppercombe.

Euphorbia Paralias, L. Sand-hills of Northam and Braunton Burrows.

Euphorbia Portlandica, L. Sand-hills of Braunton Burrows, and north end of the pebble-ridge, Northam Burrows.

Salix fusca, L. Middle of Braunton Burrows.

Spiranthes autumnalis, Reich. Dry pasture of Northam Burrows. This plant is delicately scented, like *Gymnadenia conopsea*.

Epipactis palustris, Sw. Moist spots on Braunton Burrows.

Iris foetidissima, L. Braunton Burrows, abundantly.

Juncus maritimus, Sm. Unreclaimed marsh-land on the banks of the Taw and Torridge.

Juncus acutus, L. Thirty or forty acres of Northam Burrows are covered with this plant; Braunton Burrows, &c.

Scirpus lacustris, L. Southcott Marsh.

Scirpus Holoschoenus, L. Several parts of Braunton Burrows; in a valley between the sand-hills about a quarter of a mile in a direct line from the larger light-house to Baggy Point; in great abundance in a similar valley nearly a mile from the light-house, in the direction

of the village of Braunton ; a small patch of it also occurs about a mile to the north of the last-named locality.

Scirpus Savi, S. et M., *β. monostachys*, Hook. West bank of the Torridge, within reach of the tide, about a mile above Appledore, at the bottom of a little glen between two steep banks ; sea-coast near Peppercombe ; also, in considerable abundance, about half a mile from the coast by the road-side leading from Peppercombe to the village of Horn's Cross. This solitary-spiked variety is by no means unfrequent on the coast of the Bristol Channel. It grows near the sea at Lynmouth ; and I have a specimen gathered by a friend, last summer, at Swansea.

Scirpus maritimus, L. Southcott Marsh ; also in a salt-marsh on the west side of the Torridge, above Appledore.

Agrostis alba, L., *β. stolonifera*, L. Near the estuary, Northam Burrows.

Ammophila arundinacea, Host. Braunton, Northam, and Instow Burrows.

Glyceria distans, Wahl. Salt-marsh near West-Cliff Cottage, Northam.

Festuca rubra, L. Banks of the Torridge, below Bideford.

Triticum junceum, L. East bank of the Torridge, above Instow ; west bank below Bideford Quay ; near the light-house, Braunton Burrows.

Asplenium marinum, L. Raised bank at Down End ; north side of Braunton Burrows ; near Hartland, &c.

The following list includes the rarer plants growing on the higher ground within a short distance of the valley of the estuary, consisting of parts of the parishes of Northam, Appledore, Bideford, Westleigh, Instow, Braunton, &c. :—

Clematis Vitalba, L. On the east side of the road from Torrington to Bideford, near Wear Gifford.

Ranunculus parviflorus, L. In the first field on the left hand side of the lane leading from the Bideford and Northam road to Orchard Hill.

Aquilegia vulgaris, L. In a wood on the south side of the old Bideford and Barnstaple road, about a mile from Bideford ; also in a furze-brake on the hills to the south of Northam Burrows. Certainly both these localities are distant from any house or garden.

Berberis vulgaris, L. In a hedge nearly opposite Westleigh Church, probably introduced.

Papaver hybridum, L., and *P. Argemone*, L. In an arable field leading from Westleigh to the river Torridge.

Chelidonium majus, L. Westleigh.

Corydalis lutea, DC. Reported to grow near Bideford.

Coronopus didyma, Sm. In great abundance by the road-side between Bideford and Northam; near the rope-walk on the banks of the Torridge, below Bideford.

Cochlearia Danica, L. Old walls in the village of Northam. It also occurs on Northam Burrows, but is very diminutive, and has flesh-coloured blossoms.

Cardamine impatiens, L. Side of a stream at Peppercombe, near Bideford.

Hesperis matronalis, L. North side of the lane near Fairley House, Bideford.

Brassica campestris, L. Side of a stream below Southcott, near Bideford.

Brassica Napus, L. Near Westleigh.

Reseda luteola, L. Near West-Cliff Cottage, Northam.

Viola odorata, L., *β. alba*, Bess. Runough Farm, Northam.

Viola odorata, L. With pink and variegated flowers, near Northam.

Viola hirta, L. Road-side between Instow and Bideford.

Spergularia rubra, St. Hil. Rocks by the sea-coast at Abbotsham.

Linum usitatissimum, L. On the south side of the road between Fremington and Barnstaple.

Linum angustifolium, Huds. Road-sides and borders of fields at Westleigh, Northam, Parkham, &c.

Acer campestre, L. Lane between Northam and Abbotsham.

Erodium moschatum, Sm. West side of the lane leading from Westleigh to Lower Southcott; road-side near Westleigh Church, abundantly; close to the turnpike on the road from Bideford to Northam; road-side near Glen Burren House; road-side, Torrington Common.

Oxalis stricta, L. Very common throughout the parish of Northam, in arable fields, gardens, and orchards. In many parts it is so abundant as to become a troublesome weed. Gardens on the south-west side of Bideford; between Torrington and Littleham, three or four miles from the Northam locality. The plant has all the appearance of being truly wild.

Euonymus europæus, L. New road between Bideford and Instow.
Ulex nanus, Forst., β . *Gallii*, Planch. In considerable abundance between Bideford and Torrington.

Medicago sativa, L. Hedge-bank between Instow and Fremington.

Medicago maculata, Sibth. Very abundant about Northam and Bideford.

Melilotus vulgaris, Willd. Clover-field at Northam, probably introduced amongst the clover-seed.

Trifolium scabrum, L. Between Southcott and Westleigh.

Lotus major, Scop. Westleigh.

Vicia sativa, L., β . *angustifolia*, R. Side of the lane between Southcott and Westleigh.

Vicia sylvatica, L. On the cliffs near Abbotsham this plant assumes a prostrate habit, creeping over the rocks; near Clovelly.

Pyrus communis, L. Borders of a wood on the south side of the old Bideford and Barnstaple road, about half a mile from Bideford.

Pyrus Malus, L. Common in the hedges about Northam.

Pyrus torminalis, Sm. Woods above Clovelly.

Ribes Grossularia, L. Hedges near Bideford.

Sedum Telephium, L. Hedge-bank between Torrington and Forthelsloch.

Sedum Anglicum, Huds. Rocks about Bideford, and on the sea-coast near Abbotsham.

Sedum album, L. Old walls of Southcott.

Sedum acre, L. Walls about Bideford and Northam.

Sedum reflexum, L. Old wall, Westleigh.

Sempervivum tectorum, D. Southcott Bacton.

Cotyledon Umbilicus, L. Very abundant on old stone fences about Bideford, Southcott, Westleigh, and Northam.

Saxifraga tridactylites, L. Top of a wall by the road-side between Bideford and Northam.

Cornus sanguinea, L. Hedges about Northam, &c.

Ægopodium podagraria, L. Bideford church-yard.

Fœniculum vulgare, Gærtn. Abundant by the road-side on the east bank of the Torridge, between Bideford and Southcott; hedge-rows about Northam.

Crithmum maritimum, L. Raised bank at Down End, north side of Braunton Burrows.

Pastinaca sativa, L. In great abundance in the neighbourhood of Bideford.

Anthriscus cerefolium, Hoffm. Old road between Bideford and Barnstaple.

Viburnum Opulus, L. Road-side between Instow and Fremington.

Rubia peregrina, L. Very common in the hedges about Northam.

Scabiosa columbaria, L. By the road-side between Bideford and Instow.

Tragopogon pratense, L. Road-side near the fir-plantation between Bideford and Southcott.

Helminthia echioides, Gærtn. About Southcott.

Cichorium Intybus, L. Between Bideford and Northam.

Serratula tinctoria, L. Near Southcott, close to the new Bideford and Barnstaple road.

Centaurea Scabiosa, L. Near Southcott, &c.

Senecio squalidus, L. Abundant on the south side of Bideford ; old well in Meddon Street, and waste ground below the savings'-bank. The foliage of the plant gives forth a fine aromatic scent, when bruised.

Inula Conyza, DC. Hedges about Southcott, &c.

Veronica Buxbaumii, Ten. Arable fields, Northam.

Antirrhinum majus, L. Old walls about Bideford.

Antirrhinum Orontium, L. Fields near West-Cliff Cottage, Northam.

Linaria Cymbalaria, Mill. Old walls near Bideford, Southcott, &c.

Linaria spuria, Mill. Arable fields about Southcott and Westleigh.

Linaria Elatine, Mill. Fields near Bideford, Northam, Southcott, &c.

Orobanche major, L. Furze-brake on the south side of the lane a short distance above Lower Southcott ; also, in the same locality, a variety of *O. major*, differing only from the usual form in the whole plant being of a delicate citron colour.

Verbena officinalis, L. Near Southcott Bacton.

Salvia verbenaca, L. By the side of the Bideford and Barnstaple road, near the Bideford turnpike.

Lycopus europæus, L. Below Southcott, near the Torridge.

Mentha rotundifolia, L. Near Wear Gifford churchyard.

Mentha viridis, L. Road-side near the turnpike, Yeo Valley, probably introduced.

Calamintha officinalis, Mœnch. Common about Northam, Bideford, &c.

Calamintha Acinos, Clairv. Arable fields between Northam and the river Torridge.

Melittis Melissopyllum, L. On the river side of the road leading from Bideford to Torrington, about a quarter of a mile from Bideford; on the east side of the road leading from Westleigh through Lower Southcott to Torrington, about half a mile to the south of where it crosses the old Bideford and Barnstaple road. It also occurs in one or two parts of the wood adjoining the road.

Leonurus Cardiaca, L. Near Nine Houses, Lower Southcott; head of the Yeo Valley;—probably introduced in both localities.

Lamium Galeobdolon, Crantz. Wood between Bideford and Torrington.

Myosotis palustris, With. Road-sides at Witham, &c.

Myosotis collina, Hoffm. Near Peppercombe.

Lithospermum arvense, L. Fields about Northam.

Symphytum officinale, L. Moist meadows up the Yeo Valley.

Anchusa sempervirens, L. Burrough Farm, Northam; and orchard near West-Cliff Cottage, Northam.

Lysimachia Nummularia, L. Near the Torridge, between Northam and Bideford.

Anagallis arvensis, L., *β. cærulea*, Aut. Pallida, and varieties with pink and white flowers, blotched with deep red. Arable field between Northam and Bideford.

Armeria maritima, Aut. Cliffs at Abbotsham, and rocks near the Torridge.

Chenopodium olidum, Curt. Top of High Street, Bideford.

Daphne Laureola, L. Thicket near the Barnstaple and Torrington road, about two miles and a half from Bideford.

Euphorbia amygdaloides, L. Near Bideford.

Quercus Robur, L., *c. sessiliflora*, Salisb. By the side of the Bideford and Torrington road, about three quarters of a mile from Bideford.

Epipactis latifolia, Sw. Near Bideford.

Narcissus biflorus, Curt. Under some trees in a meadow between Northam and Bideford.

Narcissus Pseudo-narcissus, L. In abundance near Northam.

Galanthus nivalis, L. Reported to grow near Bideford.

Ruscus aculeatus, L. In a hedge by the side of the path leading from Westleigh House to Westleigh Church.

Carex axillaris, Good. Peppercombe Glen.

Phalaris Canariensis, L. Road-side between Fremington and Instow, probably introduced.

Avena fatua, L. Arable fields in the neighbourhood of Northam.

Glyceria rigida, Sm. Old walls, Northam.

Festuca bromoides, L. Old wall, Burrough Farm, Northam; old wall, Torrington Common.

Festuca pseudo-myurus. Old walls, Torrington Common.

Hordeum pratense, Huds. Southcott, &c.

Ceterach officinarum, Willd. Old walls of Ford House, near Bideford.

Scolopendrium vulgare, Sym., *β. crispum*, Sm. Near Hartland.

γ. multifidum, Sm. Common in the neighbourhood of Bideford, &c.

δ. ramosum, Sm. Road-side near Wear Gifford. I have a specimen, gathered at Hartland, in which the frond is developed as two barren, reniform lobes.

Osmunda regalis, L. Sea-coast near Hartland; reported to grow on the bank of the Torridge, above Bideford.

GEORGE MAW.

Barrat's-Hill House, Broseley, Salop,
December 14, 1852.

NOTICES OF NEW BOOKS, &c.

'*On the Growth of Plants in Closely-glazed Cases.* By N. B. WARD, F.R.S., F.L.S., &c. Second Edition. London: John Van Voorst. 1852.'

It is with feelings of great pleasure that we welcome a second edition of Mr. Ward's interesting little volume. A period of ten years has elapsed since the publication of the first edition,—a period, alas! that argues too forcibly, too irresistably, that in this country we are not sufficiently alive to the combination of the useful and the ornamental,—a combination achieved by Mr. Ward, in the highest possible degree; for, what can be more useful, what can be more conducive to the well-being and comfort of man, than the safe transport of those plants on which, under Divine Providence, his healthful existence may be said to depend, from the country of their nativity to the country of their consumption:—and what can be more orna-

mental, what more delightful, than the introduction of those lovely vegetable forms—whose delicate tracery was designed, by the same Almighty Ruler, to adorn the humid ravines of the tropics—into our gardens, our greenhouses, and our drawing-rooms!

The second edition of Mr. Ward's work, like the first, goes into various subjects not strictly within the compass of its title, and certainly not within the province of the 'Phytologist' to criticise. Such, for instance, are the chapters intitled respectively "On the application of the closed plan in improving the condition of the poor" and "On the probable future application of the preceding facts." On these subjects we are glad to be excused from the expression of an opinion. It is far different, however, with what may be termed the practical part of the work, and especially with the chapter "On the conveyance of plants on ship-board." Here Mr. Ward is an experienced guide, dealing with facts alone; and the results, as recorded in the Appendix, speak for themselves.

In conclusion, we have to notice with cordial approbation the neat manner in which the work has been brought out, and the extreme beauty of the illustrations, which have been supplied by Mr. E. W. Cooke and Mrs. S. H. Ward.

'*The Botany of the Malvern Hills.* By EDWIN LEES, F.L.S., &c. Second Edition, enlarged and corrected. London: Bogue, Fleet Street.' [No date; received November, 1852].

"I come to this sweet place for quiet," is the quotation with which Mr. Lees opens the botanical arcana of this neat little *brochure*. So, once, did we; but quiet was not there. The little party, of which the editorial *plural* of the 'Phytologist' formed a *unit*, was persecuted by a host of itinerant venders of disgusting comestibles, fortune-tellers, donkey-drivers, and beggars. This nuisance having become intolerable, we stepped over an almost invisible fosse, much like a single plough-furrow, on to a portion of the bare hill-side which the said fosse was supposed to mark as cultivated ground. Here the assailants in the rear halted; and we began to chuckle, very innocently, as we thought, at their discomfiture. Alas! we had only been leaping out of the frying-pan into the fire. We soon saw a human being, of extraordinary figure and doubtful sex, shuffling towards us, with all the haste it could achieve. Arrived within earshot, it assailed

us with a volley of oaths, in the loudest and most discordant tones. We were trespassing! *We*, still the editorial *unit*, apologized: "we had no intention of trespassing; the virgin soil had never been broken; there were no traces of cultivation; *but*, as we were wrong, we would re-cross the fosse, and retire." Suiting the action to the word, we vacated the enemy's territory; but during the brief parley two athletic fellows, armed with bludgeons, had joined the party, and coarsely informed us that unless we gave them half a crown per head they would dog us all day, and take us before a magistrate as soon as we returned to our inn. We paid the fine, right glad to escape the proximity of the bludgeons of such ferocious-looking banditti. Under these circumstances, we feel entitled to advise the explorer of the Malvern Hills, on a fine day, to provide himself with sufficient pocket-money to buy off the mercantile vagrants, and also to observe very carefully where he is treading, lest he inadvertently step over an *invisible* fence, and thus commit a trespass. By strict attention to this advice and caution, he may perchance attain that "quiet" for which people visit such "sweet places." It is, however, a lamentable thing, that almost every foot of uncultivated ground worth visiting is beset by lazy and dissolute, but licensed, vagrants, who subsist on the fears or the folly of the visitors.

Having relieved our mind of these weighty matters, we dip into Mr. Lees's little volume once more; and we would venture to remark that the new arrangement, or system, which Mr. Lees has introduced does not seem to us any improvement on the usual mode. Mr. Lees explains his system in these words:—"I have distributed the plants in the three grand Natural Divisions, but subdivided them on the Linnæan plan, for convenience' sake to the memory, and to avoid the necessity of an index." Without gainsaying these merits, we may perhaps be allowed to remark that they are not self-evident. Each of the Linnean classes, Diandria, Triandria, Tetrandria, Hexandria, Octandria, Monœcia, and Dicoëcia occurs twice over, an arrangement that would not, at the first blush, strike any botanist as rendering assistance to the memory.

Every local Flora is acceptable; and this, penned by a botanist who has so long resided on the spot, or in its immediate vicinity, is doubly so, because we must regard it as in a great measure complete. No one ever enjoyed the opportunity of more thoroughly investigating a locality than Mr. Lees has that of Malvern; and we give him credit for having availed himself, to the utmost, of the advantages which long residence, industry, and a taste for the subject confer. We

therefore hail the Botany of Malvern as one of the most perfect local lists of plants that has ever reached our hands ; and, as such, we cordially recommend it to our friends. With these preliminary observations, we proceed to give some lengthy extracts.

“Localities of Plants.—The stranger who proposes to botanise in this district must not expect to gather all its remarkable plants in a cursory ramble on the hills. In fact, most of the rarer plants occur rather in the valleys, or about the woods at the base of the chain, than on the rocky summits themselves. But if the botanist has a few leisure weeks to dispose of, with a zest for ramble, he will find abundant scope for observation and enjoyment.

“Early in the spring, the wood-spurge throws a light green verdure about the declivities, contrasting well with dead grasses, withered brakes, and the dark tufts of yet unflowered gorse ; soon after, tufts of broom in many spots vein the hill-side with golden gleams ; and about midsummer, the fronds of the brake give a verdant cincture to the then arid masses of rock, bearded with crisp lichens. But on the rocky masses themselves much depends upon a showery season, as then minute plants are well developed, scarcely observable at any other time.

“The vegetation of this district may be traced in three divisions, accordant not only with the obvious surface-aspect of the country, but with its geological relations. The first division comprises the flat country eastward of the hills to the Severn, whose course, setting aside curvatures, is nearly parallel to the Malvern chain, the distance from the river varying in the space between Worcester and Tewkesbury from five to about seven miles. The whole of this plain consists of red marl, with deposits of diluvial gravel in various places, close to or within short distances of the river. To the south of Upton, several isolated hills of lias limestone occur ; and north of that town various tabular or roof-shaped hills of red marl, more or less covered with wood, run parallel with the Severn, and beautifully diversify the scene. Even nearer the hills, especially southwards, many fortress-like eminences start up in a picturesque manner, and, robed with foliage, greatly relieve the tame flat that would otherwise present itself.

“Yet the wide green commons that stretch around the hills eastward, belted in by woodlands and ever verdant, have a peculiar and pleasing character under varying atmospherical influences, when in a summer afternoon the great mountain shadow covers them in gloom, slowly impinging upon and lessening the farther landscape’s brightness ; and, pictorially, it must be regretted that such recent innova-

tions have been made upon the extensive waste of Welland Common, that, for some time to come, that part of the country must assume the appearance of a surveyor's map.

"The drainage of the whole district is received by the Severn, even from the Silurian limestone on the western side of the ridge; for the river Ledden, that, flowing past Ledbury, collects the streams from the southward, after a farther course of ten or twelve miles, flows into the Severn at Gloucester. Throughout the whole eastern plain no lake or even pool of any striking dimensions occurs; but the streams that flow from the hills in the direction of Eldersfield, the Berrow, and Longdon, being precluded from reaching the Severn directly by the intervention of steep banks of marl, and having only one outlet to that river with scarcely any fall, necessarily accumulate in the flat meadows, forming *marshes* of considerable extent, and entirely overflowed in the autumnal season. Many efforts have been made to drain these marshes, and deep ditches beset them on every side; but, having only one sluggish outlet, and being, in fact, in many places below the level of the bed of the Severn, it appears impracticable to provide an adequate drainage for them. Thus these marshes present a curious appearance, hemmed in on all sides by land in the highest state of cultivation, which is continually impinging upon them. Longdon Marsh well deserves a visit to its margin, which should be made by way of Castle Morton; and the following rare or local plants which grow about, or in the wide watery ditches there, will well repay the trouble: *Hippuris vulgaris*, very plentiful; *Scirpus maritimus*, on the eastern side; *Lysimachia vulgaris*, *Lonicera Xylosteum*, on the Longdon side, by a lane leading to the northern end of the marsh; *Apium graveolens*, *Oenanthe peucedanifolia*, *Oe. Lachenalii*, *Triglochin palustre*, *Rumex maritimus*, *Butomus umbellatus*, *Rosa spinosissima*. In the marshy flat meadows at the end of the lane leading down from Castle Morton may be observed, before the mowing of the grass, *Lathyrus palustris*; the pretty *Cnicus pratensis*, rather plentiful; *Senecio aquaticus*, *Orchis latifolia*, *Habenaria viridis*, *Carex intermedia*, *distans*, and many others.

"The extensive commons of Welland, Castle Morton, Barnard's Green, &c., have many plants that are localised there only, as *Bupleurum tenuissimum*, *Helosciadium inundatum*, *Petroselinum segetum*, *Myosurus minimus*, *Polygonum minus*, *Tormentilla reptans*, *Mentha piperita*, *Nasturtium terrestre*, *Pulicaria vulgaris*, and *Anthemis nobilis*.

"The second division will comprehend the hills themselves and their immediate roots; while the third comprises the calcareous

'Silurian' country westward of the hills. Cowleigh Park, at the northern end of the chain, and including in its wild boundary several syenitic spurs, well deserves examination. Here grow *Rosa tomentosa*, *R. villosa*, *Rubus Bellardi*, *R. pallidus*, *fuscus*, and *Schlectendalii*, *R. echinatus*, *Lepidium Smithii*, and a variegated-leaved variety of *Quercus sessiliflora*. Beyond Cowleigh Park the dense covert of Rough Hill Wood offers itself to tempt the onward foot of the explorer; and in the moist meadows between that eminence and Leigh Sinton, *Hypericum Androsæmum*, *Gymnadenia conopsea*, and *Habenaria viridis*, may be gathered. The Old Storage Hill lies in this direction, and the brook that enters its secluded recesses presents many scenes of wood and water delightful both to the contemplative and botanical eye.

"The rocks of the hills themselves have some plants that mostly flourish only there, such as *Galium saxatile*, *Plantago Coronopus*, *Hyoscyamus niger* (Hereford Beacon), *Helosciadium repens*, *Arenaria rubra*, *Cotyledon Umbilicus*, *Sedum album* (North Hill), *S. Telephium*, *Spergula nodosa*, *Potentilla argentea* and *verna*, *Orobanche major*, *Corydalis claviculata*, *Erodium maritimum* (North Hill), *Gnaphalium sylvaticum* (End Hill), and of course most of the Ferns. The Hollybush Hill, with the ravine called 'The Gullet,' between it and the Warren Hill, should, if possible, be examined; and in the bogs, which occur at the *western bases* of the hills, will be found the beautiful *Eriophora*, *Pinguicula vulgaris*, *Anagallis tenella*, the fly-ensnaring sundew, and a plentiful supply of *Carices*.

"The natural crest of the Ridgeway in Eastnor Park, splendidly wooded as it is on either side, with the grand Camp Hill towering above, is invested with interest to both geologist and botanist. Gloomy yews, of indigenous growth, in some places shadow the road; in others, the glaucous-green juniper adorns the scene; the *Polygala* shows its varying flowers of blue, pink, or white; and *Chlora perfoliata*, *Habenaria chlorantha*, *Bromus erectus*, and *Avena pubescens*, flourish on the rocky soil most luxuriantly.

"Many delightful rambles may be made in the woods on the *western side* of the hills, or about the limestone quarries; the 'Croft,' in particular, towards Mathon, is a good locality. Most of the following plants may be gathered in this vicinity, being confined to the calcareous strata. *Viola hirta*, *Gentiana Amarella*, *Pimpinella magna* (Cradley and Suckley), *Chlora perfoliata*, *Chrysosplenium alternifolium*, *Aquilegia vulgaris*, *Linaria minor*, *Anthyllis Vulneraria*, *Vicia sylvatica*, *Cnicus eriophorus*, *Orchis pyramidalis*, *Habenaria chloran-*

tha, *Ophrys apifera*, *Listera Nidus-avis*, and *Epipactis latifolia*. Wood lyme grass (*Elymus Europæus*) is also peculiar to the western woods.

"Purlieu Lane, and some other hollow ways about Mathon and Cradley, still exhibit the old country characteristic of the roadway and the water-course existing in conjunction; and in such deep recesses *Lathræa squamaria* and other shy plants delight to hide from the glare of daylight. Here the wanderer finds himself deep in the soil, and almost floating with the stream, while thick masses of verdure, from pollard oaks and battered hollies, overspread the twilight scene; and old boles and mossy roots are covered with the untouched hoary mould of centuries, or inscribed with the curious characters the lirellæ of *Opegrapha lyncea* or *Graphis scripta* form in such places.

"It has been remarked that more plants occur here varying with *white* flowers than is usual in other places; and I have observed the following plants thus sportively circumstanced: *Veronica officinalis*, *Scabiosa succisa*, *Erythræa Centaureum*, *Campanula Trachelium*, *Anagallis tenella*, *Agraphis nutans*, *Calluna vulgaris*, *Aquilegia vulgaris*, *Ajuga reptans*, *Betonica officinalis*, *Prunella vulgaris*, *Pedicularis sylvatica*, *Digitalis purpurea*, *Vicia sepium*, *Ballota fœtida*, *Bartisia Odontites*, *Antirrhinum majus*, *Polygala vulgaris*, *Ononis arvensis*, *Carduus nutans*, *C. palustris*, *Orchis pyramidalis*, and *O. mascula*.

"The following plants have either become very recently denizens of the Malvern district, or have been previously unrecorded in the localities where they now appear: *Veronica Buxbaumii*, *Echium vulgare*, *Erythræa pulchella*, *Cenanthe Lachenalii*, *Sium angustifolium*, *Bupleurum rotundifolium*, *Rumex pulcher*, *Epilobium virgatum*, *Polygonum mite*, *Geum intermedium*, *Scrophularia Ehrharti*, *Orobanche minor*, *Limosella aquatica*, *Lepidium Draba*, *Barbarea præcox*, *Geranium striatum*, *Orobis tenuifolius*, *Lathyrus Aphaca*, *Lactuca Scariola*, *Hieracium umbellatum*, *Callitriche pedunculata*, *Myriophyllum alterniflorum*, *Salix acuminata*, *Juncus obtusiflorus*, *Alopecurus fulvus*, *Avena pubescens*, *Lolium multiflorum*, and *Potamogeton prælongus*.

"More than half the plants occupying the Malvern Hills are Cryptogamic, as will be seen by the following enumeration, which includes the productions not only of the syenitic ridges themselves, but of the country eastward to the Severn, northward to the Teme, southward to Redmarley on the Ledden, and westward to the Silurian heights parallel with Ledbury. Undoubtedly considerable additions may yet be made to the Algæ and Fungi; for I have not been able to give much attention to the Algæ Confervoideæ, nor have I taken but very

little note of the minuter species of Sphæria, &c. among the Fungi; but I have recorded nevertheless all the really tangible and decided forms that have fallen under my observation (independent of minute microscopical examination) during a period of twenty years.

ENUMERATION.

PHANEROGAMIC VEGETATION.	{	Dicotyledonous plants	625	
	{	Monocotyledonous plants	177	
		Total Phanerogamic	802	
CRYPTOGAMIC VEGETATION.	{	Ferns and Equisetacæ	24	
	{	Mosses	145	
	{	Jungermannia	28	
	{	Other Hepaticæ, Characæ, &c.	28	
	{	Lichens	254	
		Fungi	398	
		Total Cryptogamic	877	
Entire number of Malvern plants			1679	

“Thus in a small tract of country, sixteen miles in length and about eight or ten in breadth, nearly seventeen hundred species of plants are found, without including minor mycological productions.”

PROCEEDINGS OF SOCIETIES, &c.

BOTANICAL SOCIETY OF LONDON.

Monday, November 29, 1852. (Sixteenth Anniversary Meeting).

—Dr. John Edward Gray, F.R.S., President, in the chair.

Mr. G. E. Dennes, the Secretary, read the Report of the Council; from which it appeared that 14 new members had been elected since the last Anniversary Meeting, and that the Society now consisted of 302 members. Many thousands of specimens of British and foreign plants had been distributed to members, and numerous continental botanists; and increased exertions had been made, this year, to render this important department of the Society's operations more efficient; and, already, numerous valuable specimens had been received for distribution to the members early in the ensuing year. The Report was unanimously adopted. A ballot then took place for the President and Council for the ensuing year, when the President was re-elected; and he nominated John Miers, Esq., F.R.S., and Arthur Henfrey, Esq., F.R.S., Vice-Presidents.

John Ball, Esq., M.P., F. P. Pascoe, Esq., F.L.S., and J. T. Syme, Esq., were elected new members of the Council, in the room of Dr. Palmer, J. Coppin, Esq., M.A., and J. Woollett, Esq. The Treasurer, Secretary, and Librarian were re-elected.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, December 9, 1852.—Professor Balfour, V.P., in the chair.

The following gentlemen were elected office-bearers for the ensuing year:—President: Professor Balfour. Vice-Presidents: Professor Christison, Professor Fleming, Major Madden, and Dr. Seller. Council: Mr. James Cunningham, W.S., Mr. Charles Jenner, Mr. Henry Paul, Mr. John M'Laren, Mr. James M'Nab, Dr. Parnell, Dr. Lauder Lindsay, Dr. Dobie, Mr. John Matthews, and Mr. George S. Blackie. Honorary Secretary: Dr. Greville. Foreign Secretary: Dr. Douglas MacLagan. Auditor: Mr. Brand. Treasurer: Mr. Evans. Curator of Museum: Mr. Thomas Anderson. Assistant Secretary and Curator: Mr. G. Lawson.

The following donations were announced to the Society's library and herbarium:—From Mr. Henfrey,—his paper on the Structure of the Stem of the *Victoria regia*; from Mr. Paul,—Exchange Lists of the Christiania Botanic Garden, and a packet of Norwegian Plants; from Mr. T. Moore, Chelsea Botanic Garden,—his List of British Ferns, adapted as Labels for the Herbarium; and from the Smithsonian Institution, Washington, U.S.,—the following publications:—'Fourth and Fifth Annual Reports of the Board of Regents of the Smithsonian Institution,' 'Programme of Organization of the same,' 'Registry of Periodical Phenomena,' 'List of Works published by the Smithsonian Institution,' 'List of Foreign Institutions with which the Smithsonian Institution is in Correspondence,' 'Abstract of the Census of the United States,' 'Directions for Collecting Specimens of Natural History,' 'Notice of the Origin, Progress, and Present Condition of the Academy of Natural Sciences of Philadelphia,' by J. W. Ruschenberger, M.D., Surgeon U.S. Navy, 'Reports from the Commission of Scientific Inventions, in relation to Sugar and Hydrometers, made under the superintendence of Professor A. D. Bachey,' by Professor R. S. McCulloch, 'Report of the Commissioners for Patents, for the year 1852,' Part II., Agriculture.

Professor Balfour exhibited the following donations, made to the Museum of Economic Botany at the Royal Botanic Garden, since the last meeting of the Botanical Society, *viz.* :—From Professor Simpson: Three specimens of the fruit of a species of sago palm (*Sagus*), from Calabar. From Professor Christison: Specimens of poison-nuts, from Calabar, apparently the seeds of a Leguminous plant. In exhibiting these to the meeting, Dr. Balfour took occasion to mention that the seeds produce effects similar in many respects to poisoning with aconite. He stated that Dr. Christison had swallowed about a quarter of a seed; and it had produced alarming symptoms, such as depression of the heart's action, and intermission of the pulse, requiring the use of ammoniacal stimulants. From Sir Walter C. Trevelyan, Bart.: A collection of fruits and seeds, consisting of 2973 species and varieties. From Henry Paul, Esq.: A bowl, with chain and ladle, from Christiania, all connected together, and cut from one piece of wood, without joining. From Dr. Greville: A specimen of *Trentepohlia pulchella*, from Craven, Yorkshire, spreading over a stone between three and four inches in diameter, and giving to it a fine purple covering on one side.

Dr. Balfour laid on the table two numbers of a new German periodical, entitled '*Bonplandia*,' to be published twice a month, under the editorship of Messrs. Seemann and Rümpler.

Mr. A. Bryson exhibited a beautiful polished pedestal, having the appearance of a solid block of black marble, made from the stem of the gru-gru palm (*Acrocomia sclerocarpa*); also a circular ottoman, made from the stem of the mountain cabbage palm (*Euterpe montana*).

Alpine British Plants, particularly Hieracia.

Dr. Balfour exhibited a series of alpine specimens, transmitted by Mr. Backhouse, including three species of *Polygala*, *Myosotis suaveolens* (from Yorkshire), *Polypodium alpestre* (from several localities), and a series of *Clova* and *Braemar Hieracia*. The latter included nearly every alpine form found among the mountains of that district. Mr. Backhouse states that in adopting five or six new names for those of the *H. alpinum* group, &c., it is not with a strong belief that all these are distinct species, but because for the present they give distinction to the distinct forms occurring among the mountains. Mr. Backhouse hopes ere long to be able to write a paper minutely describing these, and in such a manner as to enable persons to identify each form, or species, in that district at least. In mentioning forms, he alludes, of course, to the apparently permanent forms which may

prove true species. Mr. Backhouse thinks that *H. chrysanthum*, *H. globosum*, *H. alpestre*, and *H. argenteum* will prove to be good species, but that there is some doubt regarding *H. affine*, *H. gracilentum*, and *H. insigne*. Some of those near *H. alpinum* look more distinct when growing than when pressed; and the cultivated examples of *H. alpinum* and *H. melanocephalum* go far to confirm the view that they are distinct species. Considerable importance, he thinks, may be attached to the colour of the style. Of the whole *Hieracia* (fifty or sixty) Mr. Backhouse has growing specimens, carefully named and numbered; and he means to record the results of cultivation. The following is a list of the specimens shown:—

Hieracium tridentatum. One mile below Clova, Forfarshire; July, 1852. Styles yellow; ligules glabrous.

H. Lawsoni. Winch Bridge, Teesdale; June, 1852.

H. pallescens (*H. scapigerum*, Fries). Falcon Clints, Teesdale; June. Styles yellow; ligules glabrous.

H. alpinum. Stem never branching; cultivated several years. Styles always pure yellow. Does not flower twice a year.

H. alpinum. Lochnagar, Aberdeenshire; July. Granite. Styles yellow; ligules strongly ciliated; outer scales blunt and subfoliaceous, inner linear, attenuate.

H. alpinum. Canlochon Glen, Forfarshire; July. Styles yellow; ligules strongly ciliated; outer scales blunt.

H. chrysanthum, Backhouse. Cultivated two years. Roots from Scotland. Styles and florets golden yellow, very handsome.

H. chrysanthum, Backhouse, var. *H. rupestre*, Bab. Man. Cairntoul, Aberdeenshire; August. Styles and florets golden yellow; ligules slightly ciliated.

H. chrysanthum, Backhouse. Falls of the Feula, Glen Dole, Clova mountains, Forfarshire; July. Mica. Styles and florets deep golden yellow; ligules slightly ciliated.

H. rupestre, Bab., seems to be a pale, luxuriant variety of this plant. The above is branched when strong.

H. caesium, Fries. Craig Wharral, Clova mountains, Forfarshire. Mica. Styles livid; ligules glabrous. July, 1852.

H. nigrescens, Fries. Cairntoul, Aberdeenshire; July. Granite. Styles fuliginose; ligules ciliated.

H. nigrescens, Fries. Corrie of Clova, Forfarshire; July. Mica. Typical form. Styles fuliginose, &c.

H. nigrescens, Fries. Ravine of the White Water, Clova mountains, Forfarshire; July. Mica. Heads typical; styles fuliginose;

ligules ciliated; inner involucreal scales bluntish, and tipped with white pubescence.

H. nigrescens, var. Ravine of the White Water, Clova mountains, Forfarshire; July. Styles livid; ligules ciliated.

H. nigrescens, Fries. Craig Wharral, Clova mountains; July. Mica. Styles darkly fuliginose; ligules ciliated.

H. gracilentum, Backhouse, Alpine var. *H. melanocephalum* and *H. gracilentum*, Fries. Canlochen Glen, Forfarshire; July, 1852. Porphyry.

H. insigne, Backhouse. Loch Ceanndin, Aberdeenshire; August, 1852. Styles yellow; ligules ciliated; flower usually very large.

H. affine, Backhouse. Near Loch Aan, Cairngorum mountains, Aberdeenshire; July, 1852. Granite. Styles yellow; ligules ciliated; involucreal scales all linear, attenuate, acute.

H. alpestre, Backhouse. Ben-na-Bourd, Aberdeenshire; August. Granite (3000 to 3500 feet). Styles yellow; ligules coarsely but not densely ciliated; inner scales acuminate, involucre broad-based.

H. melanocephalum, var. *H. latifolium*, Backhouse. Corrie of Clova, Forfarshire; September, 1852. Mica (2500 feet). Styles livid; ligules strongly ciliated.

H. melanocephalum, var. *H. latifolium*, Backhouse. Lochnagar, Aberdeenshire; August. Granite (3000 to 3500 feet). Styles livid; ligules strongly ciliated.

H. melanocephalum, Backhouse. Second flowering in 1852. Cultivated two years. Roots from Scotland. Styles livid.

H. melanocephalum, Backhouse. Cultivated two years. First flowering in 1845. Root from Scotland. Styles livid.

H. melanocephalum. Craig Maid, Clova mountains, Forfarshire; July, 1852. Styles livid, more toothed in leaves when on harder rock or mica.

H. melanocephalum. Entire-leaved form. Craig Wharral, Clova mountains, Forfarshire; July, 1852. Mica. Styles livid.

H. corymbosum, Fries. Clova, Forfarshire; July, 1852. On heathy hillocks.

H. Norvegicum, Fries. Clova, Forfarshire; July, 1852. On heathy hillocks. Styles yellow.

H. argenteum, Fries. "Crag Chuloch," Aberdeenshire; August. Granite. Styles yellow.

H. argenteum, Fries. Kilbo Corrie, Clova mountains; July, 1852. Mica (2000 to 2500 feet). Styles yellow; ligules ciliated.

H. argenteum, Fries. Clova, Forfarshire; July. On heathy

hillocks. Involucral scales narrower than in my specimens from the south of Norway, and from Braemar, exactly resembling others from Nordland. Styles yellow.

Hieracium, sp. ? Cairntoul, Aberdeenshire ; July. Granite. Whole plant intensely glabrous, when fresh.

H. Anglicum, Fries. Canlochen Glen, Forfarshire ; July. Styles livid ; ligules ciliated.

H. Anglicum, Fries. Ravine of the White Water, Clova mountains, Forfarshire ; July. Styles livid ; ligules ciliated.

H. globosum, Backhouse. Cairntoul ; July, 1852. Granite. Styles yellow ; ligules ciliated, sometimes nearly glabrous, inner scales appressed, whole plant cæsious.

H. Saxifragum, var. *H. vimineum*, Fries. Ravine of the White Water, Clova mountains ; July. Styles livid.

H. Saxifragum, var. *H. vimineum*, Fries. Craig Wharral, Clova mountains ; July. Mica. Styles livid ; ligules slightly ciliated.

H. Saxifragum, var. *H. vimineum*, Fries. Cairntoul, Aberdeenshire ; July, 1852. Granite. Styles livid ; ligules slightly ciliated. Unusually large for Scotland, but more typical.

H. cerinthoides, Bab. and Don. Kilbo Corrie, Clova mountains, Forfarshire ; July, 1852. Mica. Styles livid ; ligules shortly ciliated.

H. cerinthoides, Bab. Cultivated two years. Root from Scotland.

H. Iricum. Castletown of Braemar, Aberdeenshire ; July. Styles livid ; ligules glabrous.

H. Iricum. Cultivated root from Teesdale.

Gnaphalium Norvegicum. Lochnagar, Aberdeenshire.

Polygala uliginosa, Reich. High moors of Teesdale, rare ; July, 1852. Discovered in spring, 1852. Root-leaves large, fleshy, bluntly ovate, with diverging veins ; flowers small. The veins or nerves of the alæ never anastomose.

Polygala vulgaris. Teesdale ; July, 1852. Plant insipid, erect, or ascending from a central tuft, rarely branching when compared with depressa ; alæ elliptical, pointing forward, nerves slightly anastomosing ; flowers numerous.

Polygala vulgaris. Heslington Fields, near York ; July.

Myosotis suaveolens. High limestone ridges of Micklefell and Littlefell, Yorkshire ; July, 1852. First found on Micklefell, in the spring of 1852.

Polypodium alpestre, Koch. Glen Fiadh, Clova mountains, Forfarshire ; July, 1852.

Polypodium alpestre, var. Glen-Isla ; July, 1852.

Polypodium alpestre. Cairntoul, Aberdeenshire ; July, 1852.

Pseudathyrium alpestre.

Dr. Balfour made some observations on the *Polypodium rhæticum*, Vill. (Voyage Botan. p. 12), *Polypodium alpestre*, Hoppe, *Pseudathyrium alpestre*, Newm. He stated that a good specimen of the plant is found in Mougeot and Nestler's 'Stirpès Cryptogamiæ Vogeso-Rhenanæ,' No. 602. The plant is said to grow in "Summis Vogesorum præruptis herbidis." It is stated by Mr. H. C. Watson to have been gathered by him in the great corrie of Ben Alder, on the west side of Loch Ericht, Inverness-shire ; also, in 1844, in Canlochen Glen. The plant resembles *Athyrium Filix-fœmina* so much as to have been passed over by many botanists ; and it had been put by Mr. Watson among his specimens of that species. It has been found of late, by several botanists, in the Highlands of Scotland, especially in the Clova and Braemar district. On looking over the plants in his herbarium, Dr. Balfour found that it had been gathered on several occasions by himself and others, and put along with specimens of *Athyrium Filix-fœmina*, as a variety of that species. Dr. Balfour exhibited, from his herbarium, the following specimens of the plant, which had also been carefully examined by Dr. Greville :—

1. From Ben Hope, Sutherlandshire ; August, 1827. Dr. Balfour.
2. Same station ; August, 1833. Dr. Graham.
3. Glen Callater ; August, 1836. Dr. Gilbert M'Nab.
4. Caenlochen, Glen Isla ; August 6, 1840. Dr. Balfour.

Distribution of Plants in Madeira.

'Remarks on the Distribution of Plants in Madeira ;' by John M'Laren, Esq.

Mr. M'Laren made some observations on the distribution of plants in Madeira, as compared with the Flora of neighbouring countries. He remarked that the vegetation of Madeira might be said to consist of two distinct Floras. One of these had a great analogy to the Flora of Algiers and the South of Spain, and contained many species common to these countries, and to the shores of the Canaries and Western Isles. This might be described as the Flora of the cultivated region. It included the naturalized trees and shrubs of the south of Europe, and most of the agricultural and littoral weeds which, from their identity with European and North-African species, were supposed to have been introduced by the agency of man, or by other natural

means. A few lowland species, not yet known as inhabitants of the Mediterranean shores, but which belong to Mediterranean genera, and do not claim affinity with the native Flora of the Atlantic Islands, he also includes in the Flora of the cultivated region. He next adverted to the native Flora of the island, which, he said, was identical in character with that of the interior of the Canary Islands and the Azores. It was well marked by the predominance of ferns, both in respect of the number of species and the fertility of individual life. Laurels and evergreen trees, with the arborescent heath, characterize the mountain scenery, and give their name to the island, Madeira signifying the land of woods. Compositæ, Ericacæ, Labiatæ, and Crucifæræ are represented by more than the usual proportion of species; Gramineæ and Leguminosæ hold an average place; and there is a remarkable deficiency in species of Rosacæ and Cyperacæ.

Mr. M'Laren gave a table showing the proportion of species in the different natural orders, for the two phyto-geographic regions here indicated, and entered into some details, to show the relations of these regions to the Flora of the Mediterranean and the Atlantic Islands respectively. The paper was illustrated by specimens collected last winter, during his residence in Madeira and Teneriffe.

Structure of Pentas carnea.

The President communicated a paper from Mr. Oliver, of Newcastle, intituled 'On certain Structures observed in *Pentas carnea*, Benth.'

This plant furnishes an instance of an interesting form of cellular tissue; it also presents singular interpetiolar processes, which seem to be of a glandular nature.

Mr. Oliver remarks:—"I have lately been engaged in a rather cursory microscopic examination of these objects, and believe that a brief notice of them may be interesting. Those interested in cell-multiplication, the relation of the primordial utricle to the secondary deposits of the outer cell-membrane, and the nature of such deposits, will find this plant, if I am not much mistaken, a useful addition to their means of prosecuting such inquiries.

"The regular, gamopetalous, tubular corolla of *Pentas carnea* is about one inch in length at the time of flowering.

"Surrounding the throat of the tube, and to about one-fourth the distance down it, to the base of the attachment of the short, free filaments with the tissue of the corolla, is a dense collection of unicellular hairs directed upwards. These hairs are slightly broader about

the middle of their length, tapering, with, sometimes, a rather undulating outline, to the distal extremity, and a little narrowed towards the base.

“Scattered in the lower portion of the corolline tube, are hairs of a different structure, consisting of a single series of several cells. These narrow from the base to the apex, and are similar in form and structure to the hairs of the petioles of the leaves, and interpetiolar processes, which I shall shortly notice.

“The corolline hairs are remarkable, from their fibro-cellular character. The nature of the spiral fibrous deposit is, however, difficult to determine. A first glance, with a magnifying power of perhaps 200 or 300 diameters, discovers the appearance of a narrow fibre, winding, in a spiral direction, up the inner wall of the cell, ascending to the right (as seen from its axis), and closely applied to the apparent outer cell-membrane, which has become in part absorbed. Numerous elongated and narrow slits, or line-like markings, occur throughout the spiral; but whether they are openings between the edges of an individual thread, or series of fibres, or analogous to the dots and slits of broken vascular tissue, it is not very easy to pronounce.

“When examined in fluid, this fibrous deposit has the appearance either of a coil of irregular breadth, or of a plexus or branching arrangement of fibre; between the threads of which, a line of division is perceptible. If a dried hair be placed under the microscope, we see but slits, narrow and rounded at the extremities, in the direction of the spiral ascent. These are probably an altered condition of the exceedingly fine separating lines which we discover in the fresh state. The portions of fibrous matter intervening between these openings is of very irregular breadth. The threads of the fibre vary, from the 1-6000th to 1-9000th of an inch, in breadth. After observation with my highest magnifying power, one of Powell & Lealand's excellent quarter-inch objectives, I am not prepared certainly to describe the true condition and arrangement of this secondary spiral deposit.

“In a hair of the young corolla (the latter about the 1-6th of an inch in length), I observed the spiral arrangement pretty distinctly. In the younger stages, the cuticle does not appear to have become absorbed to such an extent as in the matured cell, a double wall being perceptible towards the extremity of the hair.

“The primordial utricle is readily separated from the cell-wall by the application of reagents. A solution of chloride of calcium, a fluid frequently useful in mounting vegetable dissections, produces this effect

after a brief interval, the utricle becoming either almost destroyed or a mere thread lying in the cells.

"I have thought that I may have observed an alteration in the fibrous deposit connected with the irregularly-distributed convexities of the cell-wall, and which gives rise to the frequently somewhat sinuous outline of the hair; but I cannot certainly mention an instance. The spiral fibre, if such it be, is quite incapable of unrolling, at least in the cases which I have examined; and the wall of the hair tears in a manner almost totally irrespective of its direction.

"Series of spiral vessels, sometimes branching, are met with in the corolla; but I do not discover any direct communication between these vessels and the spiral cells.

"I have not detected any movement of the cell-sap in this tissue; merely, at times, a slight molecular motion.

"With regard to the multicellular hairs, these are readily obtained from any portion of the young exposed plant; but the curious filiform processes from the petiolar sheath, furnish them, without trouble, in a condition easily prepared for examination.

"The hairs consist of a variable number of cells, sometimes as many as nineteen, applied by their extremities. They almost invariably present more or less the appearance of dots, or rather slits, generally in a direction somewhat parallel with the axis of the hair, but sometimes also slightly inclined in a spiral (as in the unicellular hairs of the corolla), ascending to the right, as viewed from the centre. The edge of the lower portion of these hairs sometimes presents an almost even outline; but frequently (and perhaps nearly always toward the extremity of the hair) a slight, irregular beading occurs, exactly as we might expect were the dots or markings occasioned by external matter; but I am not sure that this appearance is incompatible with the idea that they may be openings, or slits, in a secondary deposit on the common wall of the hair, which, from an examination solely of the markings in the central portions, we might conclude they were. I have not detected, in these hairs, actual motion of the cell-sap; but mucilaginous threads may be easily seen, radiating irregularly from the nuclear vesicle, indicating such a circulation. With regard to the contents of the nucleus, I cannot certainly speak. Sulphuric acid, diluted, causes the primordial utricle to contract, and lie in the interior, as a loose sac. In some small cells, the separation is not apparent after twenty-four hour's action.

"A solution of chloride of calcium causes a partial dissolution of the primordial utricle, certain bodies, perhaps including the true nucleus, remaining visible.

"The epidermis of the interveinal spaces of the under side of the leaf, consists of cells with a sinuous boundary, numerous stomata, formed by two crescentic cells, applied by their extremities, being scattered about.

"Acicular raphides are of frequent occurrence; they abound also in the glandular stipules found between the petioles of the opposite leaves.

"The application of pressure causes the escape of very numerous raphides, together with a peculiar, thick fluid. In some instances this substance has a vermiform appearance, when forced out of the enclosing sac, owing to its having been exuded, I suppose, through a small orifice."

Mr. Oliver then gave a description of the stipulatory glands, similar to what has already been given by Weddell and others, in the case of the Cichonaceæ.

Drawings, and specimens under the microscope, were shown, in illustration of Mr. Oliver's remarks.

The following gentlemen were elected Fellows of the Society, viz.:—John Stuart Blackie, Esq., Professor of Greek in the University of Edinburgh; Alexander Cowan, jun., Esq., 30, Royal Terrace; and William John Menzies, Esq., Murrayfield House.

The Society then adjourned till the second Thursday of January.

MICROSCOPICAL SOCIETY OF LONDON.

June 23, 1852.—Geo. Jackson, Esq., in the chair.

A paper by Professor Williamson, entitled, 'Further Contributions to the Structure of *Volvox globator*,' was read.

The author's views with respect to the cellular nature of certain appearances in *Volvox globator*, as detailed by him in the 'Transactions of the Philosophical Society of Manchester,' having been controverted by Mr. Busk, in a paper lately read to this Society, and as subsequent researches have, in Mr. Williamson's opinion, confirmed his former statements as to the cellular structure of that organism, he considered it necessary to lay before the Society the present paper, containing some account of the observations by which he considers he has established the correctness of his former assertions. The object of the paper was therefore to adduce proofs, not of the vegetable nature of *Volvox globator*, for on that point both of these

gentlemen agree, but of the cellular nature of certain appearances in that body. The author described the hexagonal cells which form a peripheral stratum in the *Volvox* as being exceedingly difficult to detect in the living organism, and gave an account of their various appearances under different circumstances, stating, also, that difference of locality alone is sufficient to produce very varied appearances, as well as difference in the time of the year. The radiating threads which connect the cells were described at great length, and minutely detailed; and the conclusion arrived at was, that these threads consist partly of the ductile mucilaginous membrane of the protoplasm, and partly of its contents, the latter being present in various proportions. He also instituted a comparison between the cells in certain ulvaceous plants and those of *Volvox*, and stated that he considered the vesicles of the latter to be of precisely the same character as those of the former, and consequently that they are, in every sense of the word, real cells. The author next investigated the origin of the superficial pellicle of *Volvox*, which he considers as formed by the consolidation of the cell-walls, and then proceeded to endeavour to determine the relative periods at which the cells, the superficial pellicle, and the cilia are developed, and expressed his opinion that the cilia are the first to make their appearance, the cells and outer pellicle being subsequent growths. The nature of the fluid within the *Volvox* formed the next subject for discussion. This he considers not to be water, but, apparently, mucilage. The author then pointed out the close analogy that exists in the development of *Volvox globator* and that exhibited by many of the lower Algæ and Confervæ, and concluded by expressing his opinion that every fact brought to light by this inquiry tended to confirm his 'previous conclusions, *viz.*, that the affinities of the *Volvox* are with the vegetable rather than with the animal kingdom.

THE PHYTOLOGIST CLUB.

One Hundred and Fortieth Sitting.—Monday, December 27, 1852.

—MR. NEWMAN, President, in the chair.

Suminski's Theory of the Reproduction of Ferns.

The President made the following observations on this subject:—

"Mr. Henry Deane, of Clapham Common, so well known for the extent and accuracy of his microscopical observations, has been

engaged in examining the so-called reproductive organs of ferns, with a view to confirm or disprove the remarkable statements of Suminski, first made known to the botanical public through the pages of the 'Phytologist.' The result will be published when the observations shall be completed. In the mean time, it seems desirable to state, as a negative result of great importance, that Suminski is certainly in error in supposing that the first gyrate frond is *necessarily* dependent on the impregnation of an ovule contained in the archegonium. Whether such impregnation ever takes place, or whether it takes place in *Pteris serrulata*, the species on which the experiments of Suminski were made, remains yet to be proved; but, if it can be shown that such impregnation is not essential to the production of the gyrate frond, it follows that it is no law of Nature. It is quite evident that the gyrate frond *occasionally* originates in the disk of the proembryo, as asserted by Suminski to be the case in *Pteris serrulata*; but even in such instances the origin of the gyrate frond and the impregnation of the supposed ovule are not necessarily connected. In *Adiantum Capillus-Veneris* a totally different phenomenon is observable: in this species a portion of the margin of the proembryo—generally the portion most distant from its point of attachment to the soil—protrudes itself, and elongates into a lobe, the mesial line of which becomes gradually more thickened, and more opaque; and this thickened and opaque line eventually proves to be the incipient state of the stipes, or mesial rachis, of the future gyrate frond, which is thus evidently a prolongation of the proembryo itself. Gradually, but very perceptibly, the elongation of the lobe continues, until it becomes almost entirely absorbed into the mesial opaque line, and until its extremity curls over, and assumes a distinctly circinate character. These facts may be confirmed by every microscopist; and their tendency to overthrow Suminski's hypothesis will be admitted by all."

Asplenium fontanum in Hampshire.

The President read the following note, from Mr. W. H. Hawker, dated Ashfield Lodge, Petersfield, Hants, December 23, 1852:—

"I have been so fortunate as to discover the above fern, whose claims to be a true native have been lately so much questioned. I trust that the circumstances under which I have found it existing, may tend to restore it to its forfeited place in the British Flora. It is growing abundantly and luxuriantly, for I counted twelve tufts of it the last time I went to look at it; and I think the largest of these

tufts must be full two feet in circumference. Its situation is on the north side of an old wall, about five feet high; but it is sheltered from the north and north-east wind. It is growing in company with a good deal of *Polypodium vulgare*, and a little of *Scolopendrium vulgare*. Considering it important, if possible, to discover the history of this little old wall, I have, according to custom, consulted the 'oldest inhabitant,' who, on being taken to the spot, and questioned as to its archæology, informed me that, when he was young, there stood a large old barn there, but that it was pulled down 'better nor thirty years ago.' This wall is evidently part of the old barn. The luxuriance with which the *Asplenium fontanum* is growing, and the apparently great age of some of the plants (as shown by their size), lead me strongly to believe that it is as truly a native of the locality in which I have found it as the other ferns growing with it. I have measured some of the fronds which I have by me, and find the largest to be close upon six inches long. I have not yet worked the neighbourhood closely for ferns, but have observed *Ceterach officinarum*, *Asplenium Trichomanes*, *A. Ruta-muraria*, and other wall-loving species, whose presence shows that the locality is not adverse to the existence of *A. fontanum*. I have great hopes that, on working the neighbourhood closer, I may find it in other situations near. I have myself known of its existence in the above situation for several years, and have often gone to look at it, and admired its beautiful tufts; but I only began collecting the ferns this year, and then, for the first time, thought of examining closely my old friend, and, with the help of Moore's valuable 'Hand-Book,' soon discovered its value. I am advised, for obvious reasons, not to publish the exact locality, but will add that it is 'not a hundred miles' from the place whence I date this."

Veronica spicata, *Vicia Bithynica*, &c., in North Wales.

The President read the following note, from Mr. T. W. Gissing, dated Worcester, November 3, 1852:—

"Observing in the 'Phytologist' for November (Phytol. iv. 734) that Messrs. Shipley and Reynolds had seen *Veronica spicata* in North Wales, I was reminded that I had discovered the same plant by the Severn, in September, 1851, about four miles from Worcester. There seems considerable doubt respecting its wildness. Certainly its habitat was somewhat suspicious, being within a few yards of a garden; but all the plants of *V. spicata* I have observed in gardens have invariably been hairy, generally very much so; whereas the

plants I found were destitute of hairs. I went again this year, and found it in the same place, with a very slight hairiness. Does age or cultivation render it hairy? It did not flower this year, having been mown down with the grass amidst which it grew.

"Whilst wandering, last June, in this neighbourhood, in search of plants, I found *Vicia Bithynica*, sparingly scattered over a few yards of ground, in a thicket at the base of Crookbarrow Hill, at a distance of about two miles and a half from Worcester. I am induced to mention this, on account of being informed by botanists, who have resided here some years, that it has never been found so near this city before. Mr. Lees, I believe, has found it at Malvern; and another habitat is given by Dr. Stokes (in *Withering*), at Clifton-on-Teme. These are the only two places I have seen given as habitats for *V. Bithynica* in this county. In August, while walking with a friend, by the same thicket, he called my attention to *Allium oleraceum*, which was growing in one spot only, three feet in diameter. One side of Crookbarrow Hill yields *Spiranthes autumnalis* rather plentifully."

Lycopodium inundatum on Wimbledon Common.

The President read the following note, from Mr. R. Heward, dated Kensington, November 4, 1852:—

"In the '*Phytologist*' for October (*Phytol.* iv. 698) I read a remark relative to the disappearance of *Lycopodium inundatum* from Wimbledon Common, I am not aware whether it exists there at present; but I collected specimens about twenty years since, in a small ravine near the windmill, where it was growing in small patches, and only over a small space of ground."

Gymnogramma leptophylla in Scotland.

The President read the following note, from Mr. W. Tanner, dated Bristol, June 11, 1852:—

"I send the following memorandum, which I made when in Madeira, respecting the habitat of the supposed *Gymnogramma leptophylla* (but which I had mislaid), thinking it may be of some interest:—
'On a stone wall in Aberdeenshire, south of Invercauld House,* and east of Castletown.'"

* "I have it written '*Invercauld Hq.*,' which, I suppose, must have been intended for House, but do not know whether there is any such house."

A Descriptive List of the British Rubi.

By EDWIN LEES, Esq., F.L.S.*

RUBUS. *Raspberry and Bramble.* This intricate tribe has of late years received much attention from Mr. Borrer and Dr. Lindley; and more recently still Mr. Leighton, Dr. Bell Salter, the Rev. Andrew Bloxam, and Mr. Babington, have closely investigated the subject, and all published their ideas in monographs or fasciculi of specimens, so that the British Rubi are now much better looked after than formerly, and may be examined with some hope of being understood. As I have myself, to use a simile of Dr. Lindley's, I hope as "a fair sportsman," struck down some game in the same field, I must use my right to dress up the spoils after my own fashion: but whether the varied forms of Rubi are studied or not, the experience of all will probably show Dr. Walcott to be correct when he says—

"In our journey through life, my dear Joan, I suppose,
We shall oft meet a *Bramble*, and sometimes a *Rose*."

A. Fruticose brambles, arched and rooting at the extremity.

Subperennial.

i. **RUBI CÆSII.** Barren stem pruinose, with unequal prickles, generally with few setæ, prostrate unless supported.

R. cæsius, Linn. Stem glaucous, round, prickles slender, leaves mostly ternate, flexible and naked, panicle simple glandular, fruit glaucous, with the sepals inflexed. In low shady places.

Numerous varieties occur; more or less stout, according to exposure; one of the most remarkable is my *nudatus* (Steele's 'Hand-book'), in which the glands are obliterated. Another, the var. *Pseudo-Idæus* of Rub. Germ., has its foliage pinnate like the raspberry, with a stout erect stem. This grows at Rushwick near Worcester.

R. dumetorum, W. and N. Stem angular, setose, prickles numerous, unequal: leaves quinate, coriaceous, downy beneath; panicle branched, setose; calyx involute on the fruit. In hedges.

Many varieties occur, difficult to discriminate, the only unvarying characteristic form being the "*ferox*" of Rub. Germ., which is very stout, large, and prickly.

* From 'The Botany and Geology of Malvern, by Edwin Lees, F.L.S.'

R. Wahlbergii, Arrh. Stem angular, excessively armed with unequal prickles and setæ; leaves pedate-quinate, with overlapping leaflets, hairy on both sides; panicle branched, long, leafy and setose; sepals patent glandular; "drupes glaucous with silky hairs." Banks of Leigh Brook near Bridges-stone Mill.

R. sublustris. Stem angular, smooth (setæ rare), with distant prickles; leaves quinate, smooth above, green with soft pubescence beneath, last pair of leaflets sessile, overlapping; panicle corymbose, downy, leafy below; sepals reflex in fruit. Hedges in the low country.

This is the "corylifolius" of Smith, confounded by Weihe and Nees with their dumetorum. The flowers are generally white, appearing early, but some varieties have them purple; in others the leaves assume a monstrous aspect, the central leaflet divided. The most remarkable deviation from the type is my var. *cœnosus* (Steele's 'Handbook'), in which the stem is hairy, covered with sessile white glands, and thus often *begrimed with dust*; the panicle much branched, with numerous pale glands, and downy corymbose branches.

ii. RUBI GLANDULOSI. Barren stem arching or procumbent, more or less covered with aciculi and setæ.

R. tenui-armatus, Lees. Stem angular, sparingly setose; prickles scattered, slender, very weak, nearly equal; leaves pedate or quinate, the lowest pair of leaflets sessile, central one ovate or cordate-ovate, acuminate, all sharply serrate, downy or glaucous beneath; panicle with distant leafy branches, hairy and armed with long descending weak prickles, many setæ, and a few pale aciculi, crowded at the summit; the sepals tomentose, patent after flowering. In hedges and thickets about Great Malvern.

This characteristic species has been confounded with the dubious Schleicheri of Rub. Germ., but is certainly not the Schleicheri of Leighton's Fascic., neither, I think, of W. and N. It approaches some varieties of dumetorum, but may always be distinguished by its weak prickles, that are broken at the slightest touch, its involute sepals, and scattered leafy panicle.

R. Guntheri, W. and N. Stem prostrate, angular, clothed with long hairs and numerous setæ, aciculi, and slender prickles; leaves ternate, quaternate, and quinate, smooth above, pilose beneath, the central leaflet obovate acuminate; panicle narrow, flexuous, subracemose, hairy and glandular, with a few weak prickles; petals narrow; sepals elongated, closely reflex in fruit. Crow's-nest Wood in profusion, but a local species.

R. Bellardi, W. and N. Stem procumbent, closely hairy and setose; prickles small, weak, and numerous; leaves mostly ternate, with pale, prominent, ciliated ribs beneath; panicle closely hairy, with short aciculi, longer setæ, and weak deflexed prickles; its lower branches distant leafy, crowded at the summit; the sepals patent about the half-ripe fruit. In Rough Hill Wood to the summit. Also in woods on the Old Storage, and near Cradley.

R. Lejeunei, W. and N. Stem angular, armed with unequal prickles, with few setæ, passing into pale, weak aciculi; leaves ternate, quarternate, and quinate, often large; if ternate, the lateral lobes large, bulging towards the stem, the central one widely separate, ovate, and sharply doubly-serrate, all hairy above and downy on the ribs beneath; panicle with three or four spreading, axillary, leafy, corymbose branches, and about the same number of upper short ones, the whole much divaricated and bending when in fruit, covered with soft hairs, setæ, and aciculi, most numerous towards the summit; calyces woolly, setose, and prickly; loosely reflex in fruit. Plentiful in a dingle at the north side of Rough Hill.

The long lower branches, spreading almost at right angles, and forming a singularly wide panicle, give this plant a peculiar aspect, especially when pendent in fruit. It probably osculates with *R. rosaceus*.

R. pallidus, W. and N. Stem angular, trailing, armed with distant prickles, copiously fringed with stellate hairs, setæ, and aciculi, forming an hispid fringe surrounding the stem on all sides; leaves ternate or quinate, the leaflets elliptical, central one slightly obovate, narrowed at the base, with a long cusp, all bright green above, pallid beneath; panicle broad, hairy, and setose, with long pale prickles, and distant, corymbose, leafy branches. In Cowleigh Park plentiful.

β. Hystrix. Stem thicker, but otherwise similar; the leaves larger, all quinate with coarser serratures, pale green, and never canescent; rachis more hairy than the barren stem, and fringed with glands and aciculi; panicle very long, its lower branches very distant, leafy, and corymbose, gradually shortening and approximating to the summit. In the same thickets with pallidus.

Pallidus is a most variable plant in woods, often very attenuated and trailing, but always marked by its *elliptical* leaflets; the flowers frequently a bright mottled red, as are those of hystrix, and it appears to me that there is little difference between them, or rather a complete gradation from one to the other. Fruit seldom perfected.

- *R. fuscus*, W. and N. Stem prostrate, succulent, hairy, with few

setæ and weak prickles ; leaves large, thick, and coriaceous, coarsely serrate, green and velvety beneath ; panicle long, straggling, corymbose, often leafy to the summit, densely hairy and setose, with slender prickles interspersed ; sepals hairy and setose, closely investing the half-ripe fruit. In Cowleigh Park, and forming intricate thickets in Brockhill Wood, Colwall : green through the winter.

Very fine specimens have elongated, wide-spreading, nutant, and thyrsiform panicles, after the manner of *R. thyrsiflorus*, W. and N. : leaves larger and thicker than in any other British bramble.

R. fusco-ater, W. and N. Stem fringed with hairs, densely clothed with setæ and aciculi, graduating into unequal pale prickles ; leaves pedate or quinate, the lowest pair on short stalks retrorse, the central one obovate or cordate-ovate, with unequal teeth, cuspidate, gray, with abundant hairs beneath ; rachis clothed as the stem, grisly with hairs ; panicle very hairy and setose, armed with long pale prickles ; its branches short and leafy below, distant, but crowded at the summit ; sepals silky, with long hairs extending beyond the setæ, reflex. In Cowleigh Park, and other thickety spots.

A variable plant, much confounded in herbaria. I suspect the *R. Schleicheri* of W. and N. to be a state of it.

R. Kœhleri, W. and N. Stem densely armed with unequal straight prickles passing into aciculi ; leaves quinate, with elliptical sharply serrate leaflets, closely hairy beneath ; panicle long, narrow, very prickly, and setose. Not uncommon.

In its typical state easily distinguishable ; but if *fusco-ater* be referred to it, as is done by Dr. Bell Salter, confusion at once ensues. I am inclined to refer the *echinatus* of Lindley here, as a form with a wider and more leafy panicle, and, if possible, more setose. This grows in Cowleigh Park.

R. hirtus, W. and N. Stem excessively hairy, the dense hairs extending beyond the setæ ; prickles slender, deflexed ; leaves on densely hairy and setose petioles, their leaflets sharply cut, and gray with appressed hairs beneath ; rachis densely hairy, setose, and prickly ; panicle with distant acutely-ascending leafy branches below, upper ones crowded ; peduncles and calyces shaggy, with long hairs concealing setæ. In thick woods.

β. candicans. The petioles, under side of the leaves, rachis, and panicle canescent, with such thick-set hairs that the setæ are completely buried in them. In the Priory Grove, Little Malvern. This remarkable form Mr. Babington has referred to *R. fusco-ater*, but I think it belongs to *hirtus*.

R. scaber, W. and N. Stem angular, not hairy, but horrent with falcate or strongly declining prickles, intermixed with innumerable short setæ and aciculi, all having red verrucose bases dispersed on all sides; leaves ternate or pedate, smooth beneath, leaflets obovate, crisped and wavy at the margin, deeply cut, their midribs fringed with small prickles; panicle long, spreading, subracemose; lower branches distant, leafy, upper ones closer; peduncles hairy, densely prickly, and closely setose; sepals woolly and thorny, loosely reflex in flower and fruit. Rare. Woods on the Old Storage. An excessively prickly form.

R. rudis, W. and N. Stem dark and sulcate, hispid with short setæ, the prickles extending beyond them; leaves quinate, their lateral leaflets elliptical; central one obovate, lanceolate, sharply incised, gray with pubescence beneath; panicle long, hairy, leafy, very setose and prickly, with short branches crowded at the summits. Common in woods and thickets.

R. Radula, W. and N. Stem hispid, with numerous nearly equal setæ and few aciculi, above which the prickles stand very distinct and unconnected; leaves quinate, their leaflets ovato-elliptical, central one ovate, grayish beneath, and doubly dentate; panicle long, hairy, and setose, armed with long descending prickles; lower branches distant and leafy, upper ones closer; sepals very hairy and setose, elongated and reflex. Woods and thickets.

A fine straggling thicket bramble, and variable in aspect according to exposure; but differing from the general mass of glandulose Rubi by the fringe of setæ and aciculi on its barren stem not graduating into prickles, and the latter not ranging very close together.

iii. RUBI VILLOSI. Stem angular, arching, more or less hairy, with occasional setæ; rachis very hairy.

R. villicaulis, W. and N. Stem covered with dense white hairs; leaves quinate, densely ciliated with stiff hairs beneath; rachis closely covered with spreading and decumbent hairs; panicle long, with alternating ascending short cymose branches, the greater number naked, and few-flowered towards the summit. Not common. Rough Hill Dingle, and woods at Alfrick.

Very characteristic from the white silkiness of the long, mostly narrow panicle, and downy floral leaves. One of the most elegant of British brambles, if contemplated just before the expansion of the flowers.

R. vestitus, W. and N. (*R. leucostachys*, Sm.) Stem covered with fascicled unequal hairs (often in maturity denuded); prickles pun-

gent, hairy ; leaves quinate, coriaceous, on hairy and prickly petioles, and white with dense pubescence beneath, the central leaflet roundish-cordate, cuspidate ; panicle long, very hairy, closely armed in the central part, but less so above and below ; calyx covered with long hairs, concealing glands ; petals downy. Rough Hill Wood, &c. Rather common.

A well-marked form in its typical state, but very puzzling varieties with denuded stems often occur.

R. incurvatus, Bab. Stem angular, sulcate, slightly clothed with scattered hairs, and armed with distant declining prickles ; leaves pedate or quinate, central and intermediate leaflets ovate, undulating, crisped, and serrate-dentate at the edges, gradually acuminate, and ending in a curved point, the lower pair of leaflets seated on the intermediate, and somewhat overlapped by them ; rachis downy ; panicle long, flexuous, with distant racemous branches, the greater portion leafy, upper ones short and densely clustered ; peduncles downy and densely hairy, armed with long pale prickles ; calyx closely downy ; the sepals incurved about the flowers and immature fruit. Rare. Thickets between Cowleigh and Worcester.

This has a peculiar aspect, with a long narrow panicle, far more crowded and hairy than that of *corylifolius*, to which Dr. Bell Salter has referred it.

R. pampinosus. Stem angular, polished, with only short inconspicuous hairs, armed with many very small declining prickles at the base, longer higher up the stem ; leaves large, thin, and flexible, with scattered ciliated hairs on the veins beneath, lower leaflets seated on the intermediate, central one ovate or cordate-ovate, with coarse serratures ; rachis with a dense fringe of spreading hairs ; panicle very long, with paniculate lower branches, shortening but spreading out wider as they ascend in a thyrsiform manner, and with ternate axillary leaves nearly to the summit ; sepals densely hairy, with scattered prickles, loosely reflex in flower and fruit. In dense thickets, Cowleigh Park.

A very remarkable bramble, with leaves so large and numerous as almost to conceal the stem. It is related to my friend Bloxam's *R. calvatus*, but without the savage aspect of that rough bramble ; its leaves are almost naked, green on both sides, and its enormously lengthened, wide-spreading panicle, whose upper branches are nutant in fruit, give it claims to correct discrimination. The stem often becomes quite denuded, when it might be confounded with *R. cordifolius*.

iv. **RUBI PILOSI.** Stem arching, angular, with equal prickles, sparingly clothed with spreading hairs.

R. carpinifolius, W. and N. Stem clothed with scattered hairs, and armed with yellowish deflexed prickles; leaves quinate, hairy above, glaucous-green and pubescent beneath, central leaflet obtusely wedge-shaped, with a long cusp; panicle long, often narrow, white with hairs concealing glands, close at the summit. Colwall Woods.

R. amplifolius, Lees. Stem decumbent, very long, with scattered hairs, and deflexed prickles; leaves quinate, the leaflets elliptical, central one with a long cusp; panicle long, narrow, hairy, leafy below, the branches short and few-flowered above. In most of the woods about Malvern and Worcester.

β. *Schlechtendalii*, W. and N. Stronger and larger, with a wider developed panicle, and monstrous foliage. A singular bush of this form grows in Cowleigh Park, where it has existed many years, in the ravine by a little bridge; it has enormously developed panicles, with long paniculate branches. The shrub extends itself proliferously by annual shoots (not rooting) proceeding from the axils of the leaves.

R. macrophyllus, W. and N. Stem clothed with hairs, prickles numerous but small; leaves ternate and quinate, smooth above, the ribs and veins covered with long hairs beneath; rachis densely clothed with hairs; panicle long, with numerous spreading branches, leafy nearly to the summit; peduncles hairy, often concealing glands; fruit small. Upper part of Cowleigh Park.

v. **RUBI CANDICANTES.** Stem sulcate, angular, glaucous, hoary, with equal prickles.

R. discolor, W. and N. Stem glaucous, with minute pubescence; prickles falcate, strong, and numerous; leaves quinate, smooth above, hoary-white beneath, coriaceous; leaflets elliptical or ovate-oblong, acute, and deeply serrate; panicle long, narrow, compound, hoary, with patent almost leafless branches. Woods and thickets. Common.

This is the old "fruticosus" of English authors, and although not so variable as many other brambles, yet in the variety *macroacanthus* the stem becomes so silky, and the panicle loosely tomentose, as to put on a very different aspect to the type. Perhaps the following should only be considered a variety, but its aspect is very elegant.

R. argenteus, W. and N. Stem downy, or closely tomentose; leaves quinate, their leaflets sharply dentate, with long cusps, smooth and shining above, silvery, with dense tomentum beneath; rachis

tomentose ; panicle hairy and prickly, the upper branches densely crowded ; peduncles shaggy, closely armed with slender prickles ; sepals densely tomentose, closely reflex in fruit. Not common. Hedges near Cotheridge.

vi. RUBI NITIDI. Stem arched, angular, sulcate, smooth ; prickles nearly equal ; sepals reflex in fruit.

R. Lindleianus. Stem hairy at the base, but with only scattered hairs and polished above ; prickles numerous, sharp, declining ; leaves quinate, their leaflets elliptical, jaggedly serrate, and plicate at the edges ; panicle long, with numerous branches, generally spreading at right angles to the stem, densely crowded, compound and thorny, clothed with unequal hairs ; floral leaves incised, narrowing upwards to the entangled summit. Hedges and thickets. Not uncommon.

This bramble I originally received from Mr. Leighton, the author of the 'Shropshire Flora,' as *R. leucostachys* of Dr. Lindley ; but it is not the plant of Smith. Mr. Babington continues the name of *nitidus* for it, as given by Dr. Bell Salter ; but not being the plant of 'Rubi Germanici,' it can have no claim to an appellation given in error. See 'Phytologist' for a full account of this plant.

R. cordifolius, W. and N. Stem quite smooth, with distant prickles ; leaves quinate, coriaceous, grayish-green beneath ; central leaflet cordate ; panicle downy, lower branches spreading, leafy, upper ones cymose, crowded. Common in woods.

R. affinis, W. and N. Stem sub-erect, finally arching, smooth and polished, with declining yellow-pointed prickles ; leaves quinate, all the leaflets stalked and plicate, shining above, pale green with soft pubescence beneath, irregularly dentate, central one cordate-ovate, acuminate ; panicle short and broad at the summit, with two or three distant axillary branches below ; peduncles hairy, densely prickly ; sepals hairy, elongated, reflex after flowering, but again rising to half invest the deep black cylindrical fruit. Forming thickets among waste pastures below Malvern Wells, but rare.

This bramble seldom throws out rooting shoots, and never, as far as I have seen, occurs in hedges. Distinguishable at first sight from the two preceding, and closely approaching the sub-erect brambles.

B. *Fruticose brambles, erect or sub-erect, not rooting. Biennial.*

vii. RUBI SUBERECTI. Sub-erect, with quinate or septenate leaves.

R. plicatus, W. and N. Stem sub-erect, angular, smooth, and

polished ; prickles strong and sharp ; leaves quinate, the leaflets all stalked, central one cordate-ovate, dentate apiculate, with wide serratures, cuspidate, dark green above, pale green and pilose beneath ; rachis downy ; panicle simple, or long with many axillary branches, and large floral leaves ; sepals pilose, patent, or very loosely reflex in fruit. Rare. In moist thickets below Moorall's Well, Colwall. Birchen Grove, Worcester.

A fine tall shrub, its stem rising high in thick woods in a sub-erect manner, and often remains without any support the second year, in this case throwing out short bunches of flowering shoots from the summit, after the manner of the raspberry ; but when the stem declines to the ground the panicle becomes longer, and the lower branches distant ; the floral leaves are very large, ternate below, cordate above, and often rising above the panicle ; fruit large, irregular, consisting of many drupeolæ, red for a time, finally deep black ; the calyx is but loosely reflex, and its pilose sepals often even invest the ripe fruit.

viii. RUBI IDÆI. Erect, generally with pinnate leaves.

R. Ideus, Linn. Raspberry. Stem round, pruinose, covered with minute prickles ; leaves pinnate, white and plaited beneath ; flowers in axillary corymbs, drooping. Woods of Colwall, Mathon, &c. ; base of the North Hill, below the Ivyscar Rock.

The rapid Increase of Anacharis Alsinastrum compared with the Diffusion of other Introduced Species. By the Rev. R. C. DOUGLAS, M.A.

THE extraordinary increase of *Anacharis Alsinastrum* in the Cambridgeshire fens and elsewhere, naturally suggests inquiry into the introduction of other foreign species. The number of alien plants in our Floras is not small ; but most of them lead a very precarious life : many are confined to very small areas ; many struggle for existence about old ruins, or deserted cottages, "where many a garden plant grows wild."

The animal kingdom furnishes us with numerous instances of species originally introduced, yet soon spreading over the length and breadth of their adopted country. The English Fauna gives us three notable examples from the ranks of the Vertebrata and Invertebrata, viz., the brown rat (or Norway rat, as it is sometimes called, although

it is an introduced species in Norway as well as in England), the cockroach (*Blatta orientalis*), probably brought over in ships from the Levant, and the fresh-water mussel (*Dreissena polymorpha*). These species are mentioned towards the end of Mr. Marshall's very interesting letters on *Anacharis* (Phytol. iv. 714); but the diffusion of *Dreissena polymorpha* in our canals (though, from the harmless and obscure habits of the animal, it has not attracted general observation) bears so many points of resemblance to the rapid spread of *Anacharis*, that I may be pardoned for extracting the following passage from the 'British Mollusca' of Prof. Forbes and Mr. Hanley:—

"These mussels live gregarious, often attached in great numbers to each other, in fresh and brackish waters. Originally, apparently, inhabitants of the rivers around the Black Sea, they have gradually extended their range all over Europe; capable of enduring salt-water for a time, they have, probably, been carried across seas on the bottoms of ships, and in this manner have reached England and become so common in our canals, as to be much more abundant than many of our indigenous mollusks. Its history as a British species, dates from 1824, when Mr. J. de Carle Sowerby exhibited it to the Linnean Society, stating that it was found 'in abundance, attached to shells and timber, in the Commercial Docks, by James Bryant, Esq., who used the animal as bait for perch.' Mr. Stark found it in the Union Canal, near Edinburgh, in 1834, and the Rev. M. J. Berkeley observed it in the Nen, in 1836. In the latter case, the discoverer believed it had been introduced from Wisbeach, on timber, in 1828. Thus, it would appear to have found its way into Britain, at several points, and is now common in the canals of the Midland and Northern counties."—*Brit. Moll.* ii. 167.

The only striking instance of the rapid and unwelcome spread of introduced plants which I have been able to find, at all resembling the case of our *Anacharis*, occurred to me, unexpectedly, yesterday, whilst cutting my way (paper-knife in hand) through the pleasant pages of the recently-published second edition of Schleiden's 'The Plant.' At page 350 of that work we read:—

"The Pampas of Buenos Ayres have a character similar to that of the North American prairies, only man by his influence upon Nature has here and there impressed a peculiar stamp. The thistle and artichoke coming with the Europeans have quickly made themselves masters of the free soil, and with incredible rapidity overspread districts of many square miles with their spiny vegetation, which has developed in a luxuriance unknown in Europe. These thistle-wastes

have become a terrible nuisance, themselves robbers, depriving better plants of the soil, inaccessible hiding-places for the great thievish and sanguinary cats, and the still more dangerous human bandits, the thorny weed of semi-civilization."

Can any reader of the 'Phytologist' furnish us with a more extended account of the facts here stated? The subject is one of importance to all who feel the slightest interest in the geography of plants.

R. C. DOUGLAS.

Forebridge, Stafford,
January 10, 1853.

Extracts from the 'Proceedings of the Linnean Society.'

(Continued from page 452).

On the Position of the Raphe in Anatropal Ovules ; by Benjamin Clark, Esq., F.L.S., &c.

Mr. Clarke believes that this character, which has hitherto attracted but partial attention, is a character of much constancy in the several families, and therefore deserving a more complete examination. He states the most usual position of the raphe, when each of the carpelary margins bears a single row of anatropal ovules, as in *Pæonia*, to be lateral and turned towards the raphe of the ovules of the opposite row ; and the curvature of the ovule has the same direction even in cases where the ovule is not anatropal, as in *Colutea arborescens*. The position of raphe with reference to placenta is less regular where the ovules are more numerous, but in some cases, as in *Gomphocarpus*, it is observed to be always next the placenta, the ovules being pendulous with long funiculi ; and in *Cuphea* and *Reaumuria* also next the placenta with the ovules erect.

It is, however, when the anatropal ovule is single that Mr. Clarke believes the position of the raphe affords the most important characters, and he proceeds to consider the various relations which it bears to the placenta under six different heads, as follows :—

1. Ovule pendulous ; raphe turned away from the placenta.
2. Ovule pendulous ; raphe lateral.
3. Ovule pendulous ; raphe next the placenta.
4. Ovule erect ; raphe turned away from the placenta.

5. Ovule erect ; raphe lateral.

6. Ovule erect ; raphe next the placenta.

1. *The pendulous ovule, with the raphe turned away from the placenta*, was first observed by Mr. Brown, and afterwards figured and described by Dr. Schleiden as "ovulum spurie pendulum anatropum, raphe aversâ." Mr. Clarke finds it to be of more frequent occurrence than is generally supposed ; it is found among Endogenous plants, not only in Typha and Sparganium, but also in Chamædorea elegans (the ovule of which is, however, not completely pendulous) ; and Zannichellia and Potamogeton show a decided tendency towards it by the direction to which the ovule curves. He considers it a principal argument in favour of its being frequent at least, if not constant, in Endogenous plants, that it occurs in those groups by means of which the Endogenous and Exogenous divisions approach each other, as in Aroideæ and Piperaceæ, and in Ranunculaceæ and Alismaceæ. As Exogenous plants, in which the raphe is averse, he instances :—

1. Ranunculaceæ (when the ovule is pendulous). 2. Nelumbium. 3. Malpighiaceæ (in those genera in which the funiculus is next the dorsal rib of the carpel). 4. Coriaria. 5. Rhus Toxicodendron, and not improbably Anacardiaceæ generally. 6. Euonymus. 7. Visnea. 8. Pennantia, which he thinks should perhaps be referred to Olacineæ. 9. Chenopodiaceæ. 10. Amaranthaceæ. 11. Paronychia capitata (in the three last cases the ovule is not completely inverted, being campylotropal, but the direction of the curvature is such, that were the inversion complete, the raphe would be averse). 12. Plumbagineæ. 13. Laurineæ. 14. Aucuba. 15. Calycanthus (in which the ovule at the base is erect with the raphe next the placenta, and the upper one or two ovules are bent away from the placenta so as to become nearly horizontal, showing a tendency to *raphe aversa*). 16. Belvisiæ? 17. Dipsacus sylvestris. 18. Galenia and Tetragonia. 19. Fumaria officinalis (which shows at least a decided tendency to the same structure in having the radicle beneath the horizontal seed and turned to the hilum). Mr. Clarke adds, that he has examined numerous cases where the carpel when single is anterior, and has not yet met with any examples of this character, except in the instances of Dipsaceæ, Tetragonieæ and Fumaria. He notices some remarkable variations in the position of the raphe in the ovules of Visnea Mocanera, both when solitary and when there are two ; and concludes this section by some observations on the question whether the campylotropal ovule of Amaranthaceæ, &c. (in which the embryo subsequently formed is turned towards the placenta) is a character

equivalent to the pendulous anatropal ovule with *raphe aversa*. That it is so, he thinks proved by the examples of *Statice* and *Plumbago*, the structure of which he describes and compares with that of *Gomphrena* and *Philoxerus*; and he adduces the instances of *Trianthema* on the one hand, and *Galenia* and *Tetragonia* on the other, as well as certain genera of *Sapindaceæ*, in which the embryo is more or less curved, to show that there is no absolute distinction between anatropal and campylotropal ovules.

2. *The pendulous ovule, with the raphe lateral*, is a character of frequent occurrence; it was particularly noticed and accurately figured in *Cornus* and *Marlea*, in Sir W. Hooker's 'Journal' for May, 1850. Mr. Clarke has hitherto observed it in only two instances in which the carpel may be considered as anterior, *viz.*, in *Goniocarpus* and *Valeriana*; but it is nearly so in *Trichocladus*, and probably also in *Morina*. He has not yet observed it among Endogenous plants. Of its occurrence among Exogenous plants, he enumerates the following instances:—1. *Malpighia*, and other genera of *Malpighiaceæ*, in which the funiculus (representing the raphe) is constantly lateral. 2. *Suriana*, as figured by Prof. Lindley. 3. *Ilex*. 4. *Halesia*. 5. *Viburnum*. 6. *Acrotriche*. 7. *Myoporum*. 8. *Lonicera* (sp. *loculis uniovulatis*). 9. Probably in the 1-seeded fruits of *Oleinaë*. 10. *Thesium*. This section concludes with some observations on the variation from *raphe aversa* to *raphe lateralis*, which sometimes occurs in the same family, as in *Corneæ* and *Malpighiaceæ*, which Mr. Clarke believes to offer an explanation of the variable relation of the ovule to the funiculus, which is common to both *Illecebreæ* and *Chenopodiaceæ*.

3. *The raphe next the placenta* is well known as the most ordinary position in pendulous anatropal ovules, and Mr. Clarke only suggests the inquiry whether solitary ovules having this character ever occur among Endogenous plants.

4. *Of the erect ovule, with the raphe turned away from the placenta*, Mr. Clarke has met with only three instances, two of them occurring in cases where there are two ovules. These are *Penæa fruticulosa* and *Calytrix virgata*, in the latter case less completely averse than in the former. The principal instance, however, is that of *Compositæ*, where the raphe in four or five genera examined was always found to correspond with the anterior angle of the ovary. That the anterior is the fertile carpel in *Compositæ* Mr. Clarke thinks is shown (in addition to the arguments previously adduced by him) by the fact that in *Aster Sibiricum*, he has always found the ovule

to arise more or less distinctly from the posterior side of the ovary, and that the same circumstance occurs, although less distinctly, in *Centaurea nigra*. In such *Cichoraceæ* as he has examined, he has found the raphe for the most part or always lateral; but as he regards the carpella of this division of *Compositæ* as being right and left of the axis, he concludes that the position of the ovule might be expected to be different. The position of the raphe in *Berberis vulgaris* is occasionally next the placenta, but more frequently tends to be averse to it.

5. The character of *ovule erect, with the raphe lateral* (first observed by Mr. Bennett in *Rhamnææ*, and by him attributed to a torsion of the funiculus), obtains to a considerable extent among *Exogenous* families. It occurs regularly in *Stilbe pinastria*, and generally in one-seeded fruits of *Berberis vulgaris*; but in two-seeded fruits of the latter the raphe is removed from the placenta and placed nearer to the dorsal rib of the ovary. In *Vitis*, on the contrary, whether with one- or two-seeded cells, the raphe is always next the placenta. In a species of *Justicia*, with two ovules, placed one above the other and quite erect, the raphe is lateral; but in *Mendozia*, with a similar placentation, it is apparently next the axis. As other instances of lateral raphe with erect ovules Mr. Clarke cites *Elæagnus orientalis*, *Calamus viminalis*, and *Trianthema decandra*, the direction of the curvature in the embryo of the latter being regarded as analogous to the position of the raphe in the two former.

6. The position of the raphe next the placenta is well known to be the ordinary condition in erect anatropal ovules, and on this head the author enters into no details.

Mr. Clarke then proceeds to consider the causes by which these differences in the position of the raphe may be produced.

1. He adopts the opinion (first demonstrated by Mr. Brown) that a single ovule pendulous with *raphe aversa* is the result of an erect ovule pressed or growing downwards from the elongation of the cavity of the ovarium in that direction, while its upper part remains stationary; but suggests that it is only when an erect ovule has the raphe properly next the placenta that it has *raphe aversa*, when it thus becomes pendulous. And looking to their affinities, he thinks it not improbable that all pendulous orthotropal ovules should be referred to the same cause.

2. He believes that a single pendulous ovule with the raphe lateral is an ovule originally extending horizontally from the placenta with

the raphe lateral, as in Ranunculaceæ and Cucurbitaceæ, and subsequently pressed downwards as in the former case.

3. He maintains that a single pendulous ovule with the raphe next the placenta is the only true pendulous ovule, with the exception of pendulous campylotropal and amphitropal ovules with the foramen (and subsequently the radicle of the embryo) turned away from the placenta.

4. He conceives that one or two erect ovules with the raphe turned away or obliquely away from the placenta result from pendulous ovules pressed upwards by the elongation upwards of the cavity of the ovarium; and adduces in support of this opinion the pendulous ovules of *Geissoloma* contrasted with the erect ovules of *Penæa*, the erect ovules of *Calytrix* compared with the pendulous ovules of the neighbouring families, and the pendulous ovules of *Calycereæ* compared with the erect ovules of *Compositæ*, provided further observation should substantiate his belief that in the last-named family the raphe is really turned away from the placenta. Such ovules he would term *spuriè erecta*, in contradistinction to the opposite case, to which Sprengel has applied the term *spuriè pendula*.

5. He considers that a single ovule erect with the raphe lateral is a horizontal ovule spontaneously growing or pressed upwards by the corresponding development of the ovary; in proof of which he cites the fact that *Trianthema micrantha* has two seeds in a horizontal position, with the radicle lateral, while *T. decandra* has two erect seeds one above the other, with the radicle also in both cases lateral.

6. He considers one or two erect ovules with the raphe next the placenta (which seems general in Endogenous plants, and is frequent in all the divisions of Exogenous) as for the most part truly erect; although this position may sometimes be derived from horizontal ovules pressed upwards or spontaneously growing erect, the funiculus becoming at the same time twisted so as to bring the raphe into relation with the placenta.

Mr. Clarke then proceeds to illustrate the importance of these characters in a systematic point of view, as regards different families usually regarded as nearly related. He states that *Thymelææ* differ from *Laurinæ* in having the raphe next the placenta, and that the same difference of relation occurs in *Sanguisorbææ* and *Amygdalææ*. In all the Urtical Orders with pendulous ovules the radicle is next the placenta, or if campylotropal the direction of the curvature is equivalent, and the radicle of the embryo is turned away from the placenta; while in the Chenopodal Orders with pendulous ovules the radicle is

either turned towards the placenta or placed on one side of it. The characters thus indicated may also, he thinks, tend to a more natural distribution of the Orders related to Rhamnææ, Rutacææ and Sapindacææ. He refers also to the differences in this respect existing between Berberis and Ranunculacææ, Hedera and Cornus, Cinchonacææ and Compositæ. He states that Erythroxylon differs from Malpighiacææ in having the raphe next the placenta; and Selago in a similar manner from Myoporum and Stenochilus, in which the raphe is lateral. Scleranthus also differs both from Illecebreææ and Tetragonizææ in having the radicle turned directly away from the placenta.

In conclusion, Mr. Clarke observes that while *raphe aversa* and raphe lateral occur in several instances in the same family and possibly in the same genus (as the vertical and horizontal positions of the seed in Chenopodium appear to be equivalent characters), yet *raphe aversa*, or even raphe lateral, and raphe next the placenta are not known to occur in the same family—pendulous ovules only being understood. And also, that as far as his inquiries go, raphe next the placenta in pendulous ovules is unknown in Endogenous plants.

On Fœtid Vegetable Gums; by W. K. Loftus, Esq.

In this locality (Kerrind, Persia), the neighbourhood of which abounds in plants producing fœtid gums, Mr. Loftus, acting on Mr. Brown's recommendation, had procured several different kinds, of which, and of the plants producing them, he gives some particulars in his letter. Two of these belong to the genus Dorema, *Don*; and a third, derived from a plant, which Mr. Loftus regards as belonging to the tribe Sileridææ, is called in Kurdish "beeje." The three gums have the same general properties, and grow on a limestone soil, at the elevation of from 5000 to 7000 feet. Large quantities of gum are also produced by the wild almond, a species of Astragalus, and the Pistacia vera, which grow abundantly in the same neighbourhood; and there is, moreover, a kind of thistle, which exudes honey, especially from the bud, on being pierced by a species of Rhynchophora. Mr. Loftus proposes to resume his observations, as his party proceeds northward, in the course of the ensuing summer.

NOTICES OF NEW BOOKS, &c.

'The Earth, Plants and Man : Popular Pictures of Nature. By JOACHIM FREDERICK SCHOUW. Translated from the German, by ARTHUR HENFREY. London : Bohn. 1852.'

SCHOUW is one of the most learned as well as most pleasing of phytological writers ; exactly, indeed, that kind of author who, in this country, would be pooh-poohed by our exclusives, as making science far too attractive and popular. It is a curious fact, that our magnates conceive there is a certain dignity in confining knowledge to channels which they themselves shall shape out ; and they regard all other channels of information as vulgar, and unworthy their notice. Even the smallest of the small fry of scientific exclusives, those whose germination, to speak phytologically, has scarcely commenced, whose ascending plumule is scarcely visible, and whose radicle is wholly wanting, still turn up their noses scornfully at everything that may tend to popularise, or, as they deem it, vulgarise, science. They are either oblivious or ignorant of the immutable axiom, that there is no aristocracy in science, except the aristocracy of the mind. This wretched spirit is retarding, instead of advancing, knowledge ; is impoverishing, if not ruining, our societies ; and settles like an incubus on the inquiring and energetic spirits of the youth who, year after year, enter the fields of Nature, full of hope and enthusiasm. Luckily, Schouw is not a Briton ; and therefore his works may be read, and even admired, without fear of incurring the displeasure of the exclusives ; and the 'Phytologist' will be pardoned for introducing "extracts" which, as "original communications," and written by an Englishman, would be held derogatory to the character of a scientific journal. We believe Schouw is a German by birth, although a Dane by adoption ; and he holds the Professorship of Botany in the University of Copenhagen. His works are, we believe, invariably written in German and Danish ; and those who are well acquainted with both languages, seem to regard the German as the better version of the same ideas. The work before us is translated from the German, by Mr. Henfrey, who may truly be called one of our most industrious and painstaking botanists ; and his share of the task is admirably executed. Having thus explained that the following paragraphs are from the German of Schouw, as translated by Henfrey,

we disarm that criticism which their truthful simplicity would naturally evoke, were they original contributions to our pages :—

Man and Forests.—"Turning our attention, lastly, to the human race, we see that nations in the lowest state of development are sometimes closely connected with the forests. In the colder lands, where the trees ordinarily bear no edible, or at least no well-flavoured or nourishing fruits, it is the game which chiefly furnishes the inhabitants with food and clothing; these races then appear chiefly as hunters, such as the aborigines of North America. In the torrid zone, on the contrary, races in the same stage of culture live principally on the fruits of the trees or the pith of the trunks, like some of the tribes of Brazil, some of the inhabitants of the Indian Archipelago, and several races of negroes. South America even affords an example of a race who, almost like monkeys, live upon the trees; whose existence, in fact, is to a great extent bound to a certain species of tree. There are the Guarauni, at the mouth of the Orinoco, who live by and upon the *Mauritia* palm. While the ground is flooded, mats woven from the leaf-stalks of those palms are suspended between the trunks; these mats are covered with clay, so that fires can be made upon them, and here the Guarauni sleep, and pass a great portion of their lives. The trunk furnishes a fecula; the juice, a palm-wine; and the fruits are well-flavoured, mealy at first, and afterwards sweet. Nomadic races, on the other hand, generally avoid forests; extensive grazing plains, fertile valleys, or the slopes of mountains, affording rich pasture-land, are the best fitted for the migratory life which they lead, and for the support of their domestic animals. As soon as a race rises to agriculture, it becomes hostile to the forests. The trees are in the way of the spade and plough, and the wood gives less booty than the field, the garden, or the vineyard. The forest, therefore, falls beneath the axe, fire consumes the fallen trunks and branches, and the ashes manure the soil, giving for some years an extraordinarily rich harvest, especially in the dense tropical primæval forests. When, after the lapse of some years, the fertility decreases, a new portion of the wood is felled and burnt, and thus man proceeds unsparingly with the destruction of forests; sometimes the conflagration spreads further than was intended, and the destruction is thus increased. This is the course pursued by the peasants of Norway and Sweden, as also by the colonists of North America, of Brazil, Mexico, the Cape, Java, and in every place where agriculture first appears, or commences its first constant and uninterrupted extension. With the increase of population this destruction of the

forests is continued, for it brings with it increased consumption of the products of the forest; wood is required for houses, furniture, wagons, and other implements, for bridges, posts, for fences, fuel for cooking, and where the climate is cold, for warming the dwellings. The consumption of wood increases further with industry, with navigation and trade. Mining operations require timber, both for the works and for fuel to smelt the metals and ores; artisans and manufacturers use large quantities of the products of forests; dams against rivers and seas require their share, but above all, navigation. The trunks of millions of trees are used up in ships and masts, in order to connect the highlands and inland districts with the coasts, and the coasts with each other, even beyond the ocean. In this way civilization comes into hostile contact with the forests, and thus, under like circumstances, the country in which civilization is oldest, possesses the fewest woods. Hence forests are more sparingly met with in the countries of the Mediterranean than northward of the Alps, and more sparingly in the centre than in the north of Europe, so far as the climate is not an obstacle to the growth of timber. Have not, then, our descendants to expect a great deficiency of timber—a deficiency which may readily become disastrous? Many public economists and philanthropists have assumed this to be the case, and many do still assume it; they depict the future destitution of timber in the darkest colours, they loudly complain of the felling of wood, and they demand that governments should prevent in time the ruinous consequences, by limiting the free use of wooded estates. Yet even as I have striven to demonstrate the groundlessness of the idea of the danger which is feared of alteration of climate, by the diminution of the forests in temperate countries, I hope also to be able in some measure to scatter the dark cloud which so many imagine they see hanging over future generations in regard to the product of forests. That which is true of so many other inconveniences following in the train of civilization, holds also with this. It has its cure, in a great measure, in itself."

Man's Influence on the Vegetable Clothing of the Earth.—"But the influence of the Caucasian races, and of the Europeans in particular, in changing the distribution of characteristic plants, becomes far more extensively evident when we look to the colonies established in all climates, where in some cases the countries have passed wholly into the possession of an European population. For they have not only carried their own characteristic plants to the colonies, or those also which they had previously transplanted into their own homes,"

but they have, after acquiring countries with different climatal conditions, transplanted into these such as would not flourish at home, and thus have found themselves in a position to collect the characteristic plants of almost every race around them. Thus have the European corn-plants acquired a widely-spreading cultivation throughout North America, in Mexico, and the elevated countries of South America, in Chili and Buenos Ayres, in South Africa, in the temperate parts of Australia and Van Diemen's Land ; thus the vine has become an object of cultivation in Madeira, the Canary Islands, South Africa, and the highlands of South America ; thus rice and cotton are now grown in extraordinary quantities in the warmer parts of North America and in Brazil ; thus have the coffee-tree and the sugar-cane been transplanted into the West Indies and Brazil ; the nutmeg and the clove into Mauritius and Bourbon, and various West Indian islands ; and thus has the plantation of tea commenced in Brazil, in Java, and in India ; and the cultivation of the New Zealand flax in New Holland. The Europeans have even conveyed characteristic plants to other races, which knew how to value them. They have transferred several European and tropical plants into the South Sea Islands, which, previously unknown, are now cultivated by the natives ; the remnants of the American population which are still found in the highlands of Peru, Chili, and Mexico, have acquired European plants ; in like manner the negroes of the west coast of Africa have received from the Europeans maize, tobacco, and other American plants. On the other hand, what other races have done to change the distribution of characteristic plants, is very little : the Arabs contributed to diffuse cotton, the sugar-cane, coffee, and the date-palm ; but the Arabs belong to the same primary race as the Caucasians. The Chinese appear to have procured cotton from Hindostan, and the Japanese the tea-shrub from China. The Europeans, and above all the North Europeans, consequently are those who, both in their own home and in their colonies, have been able to acquire the greatest quantity of the characteristic plants of other races ; while their own country, especially the North of Europe, is so very poor in characteristic plants ; for all the important cultivated plants of Northern Europe have been introduced (cabbage, turnips, carrots and asparagus, which are perhaps indigenous, are among the less essential). We find in this a great proof of the intellectual superiority of these races, and we have here an example that the child of the poor man, gifted with great natural powers, industry, and activity, has far more power over prosperity than the rich heir. I know not whether there may be any among my

readers who would be inclined to see in these revolutions a serious confusion of nature, or might fear that as the races gradually appropriated each other's peculiar possessions, the globe would approach nearer and nearer to a tiresome uniformity. One sometimes hears expressions which indicate such a fear; complaints are now and then made, that interesting descriptions of strongly contrasted races become rarer in accounts of voyages and travels. Not only have many differences vanished in Europe, so that, for instance, in a drawing-room in Moscow one can fancy himself in Paris; but those attractive accounts of the natives of the South Sea Islands which the earlier circumnavigators gave us, are exchanged for reports of how the inhabitants of these islands now go clothed in the European fashion, build ships, establish schools for mutual instruction, and build churches. High up in the Himalayas, 7,000 feet above the sea, where a few years since a wild race dwelt, only visited by tired pedestrian Hindoo pilgrims, there are now, as Jacquemont reports, the baths of Simla, with sixty European houses, where people in shoes and silk stockings ride in European equipages to a dinner-party, served in the European fashion, where champagne and Rhenish wines are drunk. In Australia, where not long ago nature existed in virgin condition, and the savages stood at the lowest point, where a few suspended branches served to protect from the weather human beings who lived on sea-mollusks, there exist at present European cities, with hotels, coffee-houses, billiard-rooms, reading-rooms, and horse-races."

In conclusion, we have only to say that we cordially recommend this delightful book to the readers of the '*Phytologist*,' and beg to assure them that no fear of the exclusives need alloy the pleasure with which they will peruse it.

'Principles of the Anatomy and Physiology of the Vegetable Cell.

By HUGO VON MOHL. Translated by ARTHUR HENFREY.
London: Van Voorst. 1852.'

This work, as appears from the author's Preface, which we have quoted entire, originally appeared as an article in Wagner's '*Cyclopædia of Physiology*.' It is almost universally regarded as the highest authority on the subject of which it treats, the qualifying word, "almost," being required by the dissentient voices of some of the followers of Schleiden. The author writes throughout rather as a man who has

diligently studied his subject with a view to self-information, than as one who would dictate, or dogmatize, or enforce his own conclusions : everything is stated with the utmost candour ; and there is no apparent crotchet or hypothesis in the author's brain that leads him astray from the straightforward path of inquiry into his interesting, but rather recondite, subject. The translation affords yet another proof of Mr. Henfrey's untiring industry ; and in the present instance the subject is one in which, by praiseworthy assiduity, he has made himself perfectly at home.

Author's Preface.—"Mr. Arthur Henfrey having informed me that he intends publishing an English translation of the present treatise, I take this opportunity of making known to the English reader the purpose I had in view in the preparation of the book. The following pages were not originally intended to appear as an independent work, or to give a summary of the wide subject of the Anatomy and Physiology of Plants, but appeared as an article, in the 'Cyclopedia of Physiology' published by Dr. Rudolph Wagner, of Gottingen, drawn up to furnish students of Animal Physiology, and more particularly the Medical Profession, with a review of the Anatomical and Physiological conditions of Vegetables (of the Cell), in order to enable them to form a definite judgment upon the analogies which might be drawn between the structure and vital functions of animals and plants. This intention, together with the circumstance that I was compelled to crowd the whole exposition into the space of a few sheets, rendered it necessary to direct especial attention to the individual cell, as the fundamental organ of the Vegetable Organism. Since, however, the cell only presents itself in anatomical and physiological independence in the lowest plants, and since, in the more highly organized plants, both the structure and the physiological functions of the individual cells become subject to greater dependence upon the other parts of the plant, in proportion as the collective organization of the vegetable is more complex ; moreover, since functions then present themselves, of which no trace can be found in the lower plants, it became requisite to take account of the plants of higher rank, and of the various organs which these possess. The treatise therefore, contains if an imperfect, still, in many respects, a more extensive *resumé* of Vegetable Physiology, than might be conjectured from the title.

"Unhappily, the Physiology of Plants is a science which yet lies in its earliest infancy. Few of its dogmas can be regarded as settled beyond doubt ; at every step we meet with imperfect observations,

and consequently with the most contradictory views; thus for example, opinions are still quite divided regarding the doctrines of the development of the cell, of the origin of the embryo, and of the existence of an impregnation in the higher Cryptogams. Both in these and in other cases, the small compass of the present treatise forbids a more extensive detail of the researches upon which the opposing views are founded; I hope, however, that I have succeeded in making clearly prominent, the chief points upon which these contests turn, and thus, in facilitating the formation of a judgment by the reader; and, I have never neglected to indicate the literature from which further instruction is to be derived."

As it is quite impossible to give either an analysis or abstract of the essay introduced to the English reader by the foregoing Preface, we think that we cannot do better than assure our readers that they ought to possess themselves of so valuable a contribution to the science of phyto-physiology. We select for extract a passage on a subject of immediate, although not evanescent, interest. This, while bringing the moot question of cryptogamic reproduction instructively and lucidly before the reader, will also serve as a fair example of the matter and manner of this acceptable volume.

"*Propagation of the Cryptogams having Stem and Leaves.*—While in the three families of Cryptogamia possessing a thallus (with the exception of the Charas, to be mentioned presently), all attempts to discover male organs have proved the more vain the further the investigation of these plants has advanced, in the more highly organized families of Cryptogamia, on the contrary, in which there exists separation of the organs of vegetation into stem and leaf, the last few years have seen the discovery of convincing proofs of the existence of two sexes.

"In the last century, when Hedwig in particular devoted himself to the investigation of the Cryptogamia, the idea that two sexes must exist in all Cryptogamous plants, was quite predominant; and thus often enough without a trace of consideration, the most diverse parts were, from mere opinion, separated as male organs. This brought the whole effort to discover impregnating organs into discredit, and the opinion that all the Cryptogamia were devoid of male organs, and developed their spores without previous impregnation, became mere and more diffused. It is true that organs had been discovered in certain Cryptogamous families, especially the Charas and Mosses, which from the time of their appearance, from their position &c. stood in evident relation to the fruit; but since no positive influence

could be proved to be exerted by them upon the young sporangia, their function as anthers was denied ; although it was at the same time admitted they had a certain analogy with them, whence they were, indeed, called *antheridia*. My own researches, namely, showed that the spores of the higher Cryptogamia do not, as had been previously supposed, exhibit a resemblance in respect to their development and structure, to the seeds of the Phanerogamia, but that the most perfect agreement exists between them and the pollen-grains of the Phanerogamia. From this it necessarily, yet strangely, appeared that organs of perfectly like structure fulfilled the function of germs in one part of the Vegetable Kingdom, and in the other part constituted the male, impregnating organs ; but little as the formation of a pollen-grain depends upon an impregnation, no one circumstance showed itself in the development of the spore, at all more resulting from the co-operation of an impregnating organ. Still more doubtful did the theory of the impregnation of the Cryptogamia necessarily become, when Nägeli made the discovery, in the Ferns, of antheridia in many respects resembling those of the Mosses, which were not formed upon the full-grown plant at the same time as the rudiments of the sporangia, but occurred upon the germ-plant (*pro-embryo*), while the perfect plant was devoid of them.

“ Under these circumstances, Schleiden seemed to be warranted in characterizing the effort to discover impregnating organs in the Cryptogamia, as a mania. But by good luck, certain men who had this mania did not allow it to lead them astray in their researches, and as often happens, nature this time proved so rich that, not indeed was what had been sought found, but instead of this a series of conditions, the existence of which was previously altogether unsuspected. The researches relating to this point are, it is true, still far from their completion, since at the present moment nothing more than a preliminary notice of isolated conclusions already arrived at can be given ; but these, although isolated, cause us to expect with certainty in this field a series of the most striking discoveries.

“ The Mosses have served for a very long period as the main props of the view that two sexes and an impregnation occur in the higher Cryptogamia. Not only was attention naturally called in these to the constant occurrence of the antheridia, and their great development, but trustworthy experience, formerly of Bruch, more recently of Schimper (Rech. s. l. Mousses, 55), demonstrated that Mosses which have antheridia and the rudiments of sporangia upon the same stem always bear fruit, while dioecious Mosses never set fruit in localities

where only female specimens grow. No one has succeeded in making out the mode in which the antheridia act upon the rudimentary fruit; but the physiological fact just mentioned does not lose its force on that account.

"A second family indicating the necessity of an impregnation, were the Rhizocarpeæ, since numerous observations had shown that the large and small spores of these plants could not be separated without preventing the former growing into new plants. Schleiden, indeed, had extended his theory of the development of the embryo from the pollen-tube to this family, and arranged them with Phanerogamia. But nothing was gained by this, for, on the one hand, Schleiden's whole theory of impregnation proved a false beacon; on the other, Schleiden's statements as to the Rhizocarpeæ were not confirmed, and this more particularly in the most essential point, the mode of origin of the embryo.

"Then unexpectedly appeared Count Leszczy-Suminski's essay on the development of Ferns, the contents of which at first seemed fabulous, so contradictory were they to all that was known of the organization and development of plants. But a more minute study of this treatise—a comparison of the author's results with nature—soon showed that although he had been deceived in a few particulars, his account was far from being a creation of the fancy, and that his researches had broken open a path to a long series of discoveries.

"In all families of the leafy Cryptogamia (with the exception of the Lycopodiaceæ) antheridia have been discovered, exhibiting, it is true, considerable variations of external form and structure in the different families, but collectively agreeing in the circumstance of developing in their interior very delicately-walled cells, at first containing an amorphous substance coloured yellow by iodine, in place of which, at the epoch of maturation of the antheridia, a delicate filament presents itself, displaying several spiral convolutions, thickened at one end and running off to a very fine point at the other. The filaments manifest lively motions, exhibiting differences according to the manner in which they are rolled up, in some cases while still enclosed in the cells where they are developed, but more particularly after they have emerged into the water from the antheridium, which opens when ripe. Thus, when the filament is rolled up like a watch-spring, the motion is more or less rotatory, but if it is coiled over in the form of a cork-screw, the movement is at the same time an advancing one. In these movements the thin end of the fibre almost always goes first. Minute observation, which in many cases is very difficult, both from

the rapidity of the motion (which, however, is readily arrested by poisons), and the great delicacy of the whole structure, shows that the movements arise from extremely delicate and comparatively long ciliæ, of which two are usually found at the thin end of the filament, and which only seem to occur in larger numbers in the Ferns. The filament itself exhibits no independant motion, as indeed, altogether, the kind of motion does not indicate any will. The term seminal filaments has been not inaply applied to these filaments.”—P. 117.

PROCEEDINGS OF SOCIETIES, &c.

BOTANICAL SOCIETY OF LONDON.

Friday, January 7, 1853.—J. D. Salmon, Esq., F.L.S., in the chair.

Donations of British plants were announced from Mr. Hewett C. Watson, Mr. J. T. Syme, Mr. W. L. Notcutt, Mr. I. W. N. Keys, Mr. F. P. Pascoe, Mr. W. H. Purchas, Mr. F. Barnard, Mr. W. Bean, Mr. F. J. A. Hort, Mr. H. D. Geldart, Mr. G. Chambers, Mr. A. Irvine, Mr. T. Moore, Mr. H. O. Stephens, Mr. G. Maw, Mr. J. Whittaker, Mr. G. Brady, Mrs. Atkins, Mrs. Russell, Mrs. James, Mis Barnard, Miss Legge, Miss Griffiths, the Rev. R. C. Douglas, Rev. H. P. Marsham, Rev. T. G. Carter, Rev. T. Butler, Rev. W. M. Hind, Rev. W. R. Crotch, Mr. J. Ward, Mr. B. D. Wardale, Mr. John Ray, Mr. F. Brent, Mr. J. G. Baker, Mr. D. Oliver, and Mr. G. E. Dennes.

Asplenium viride in a Quasi-spontaneous Condition near Brighton.

Mr. Thomas Moore communicated the following paper on this subject:—

“The *Asplenium viride* is chiefly known as a native of the north and north-west parts of England, and of Wales; and no indication of its spontaneous existence to the southward has, I believe, been made public. I am indebted to the Rev. T. Rooper, of Brighton, for information of its growth in a position which, at least, appears to claim to be quasi-spontaneous, at Danny, about ten miles from that town; and Mr. Rooper has been so good as to allow me to see specimens gathered at that place, as well as to communicate the following additional particulars:—

“The fern was found by Mr. Champion, the owner of Danny, on an old brick wall forming a parapet to a cellar-window. The family have never introduced nor cultivated ferns at any period; and the plant would still have escaped notice, as it long has done, had not Mr. Champion's grandson, a little boy, of twelve years of age, taken a fancy for ferns, which induced Mr. Champion to bring in any he saw, for the amusement of the child, who was in too delicate a state of health to go himself in search of them. Among others, the *Asplenium* was gathered and brought in, without the knowledge of its being rare. I feel satisfied the plant is spontaneous, though its position may make it appear doubtful. Danny is a large Elizabethan house; and the outside walls have not been touched for many years. I have requested the family to cherish the root. There are other ferns growing in the same *locale*, but common to the country, which is rich in ferns, and contains some rather rare species. The *Oreopteris* grows in the vicinity; *Ceterach* and *Trichomanes*, a few miles from it, finer than in any other part of England; and the *Dryopteris* has lately been found not very distant. To these, might be added a long list of more generally dispersed ferns.”

THE PHYTOLOGIST CLUB.

One Hundred and Forty-first Sitting.—Saturday, January 29, 1853.
MR. NEWMAN, President, in the chair.

The President read the following notes, from Mr. J. G. Baker, dated Market Place, Thirsk, January 20, 1853:—

On the Identity of Hieracium nudicaule of Edmondston with H. murorum, Fries.

“In the account of an excursion to the banks of the Findhorn, near Forres, in the second volume of the ‘Phytologist’ (Phytol. ii. 184), the late T. Edmondston has described at length an *Hieracium* which he noticed, and proposed it as a novelty, under the specific name of *nudicaule*. It has never been generally accepted by other botanists, or identified with certainly by authors, but is mentioned in the ‘Cybele Britannica’ and the ‘London Catalogue’ as an ambiguous form or species.

“A portion of one of the specimens collected, for which I am indebted to the kindness of Mr. E. Edwards, has been for some time

in my herbarium ; and I have also had the opportunity of examining a more perfect authenticated example, in the possession of that gentleman. Upon comparing them with a series of *H. murorum*, Fr., collected in Teesdale, and in this neighbourhood, I can have little hesitation in referring them to that species, as identical in all essential characteristics. The specimens of *H. nudicaule*, from the large size and thinness of their leaves, have evidently grown in a very shady place, and belong to the extreme form of var. *sylvaticum*, Fr. (which is the most usual condition of *H. murorum* in this country) ; but some undoubted specimens of the latter resemble it closely in these respects.

“ But, whilst, if we take for granted that this is a correct view of the case, and that *H. murorum* of Fries is the true plant of Linnæus, the use of the name *nudicaule* must be discontinued, in accordance with the recognized law of priority, it is worthy of comment that the opinion of its proposer, that the plant thus designated is specifically distinct from *H. cæsium* (the *H. murorum* of ‘English Botany,’ and wholly or principally of all British authors previous to 1850), has since received the sanction, and has been endorsed by the very high authority, of Fries and Babington ; though it is most likely that Edmondston’s idea of his species was less comprehensive than that of those authors, and that he would not have considered as belonging to it various forms included under *H. murorum* by Fries ; and we may also remark that the name of *nudicaule*, though seldom applicable without qualification, indicates one of the leading distinctions in habit between that species and *H. cæsium*, Fr.”

Hieracium strictum, Fr., in England.

“ Amongst a series of *Hieracia* collected by my friend, John W. Watson, in a tour through Wensleydale, during the autumn, are several specimens of this much misunderstood species, from the neighbourhood of Bolton Castle, on the north bank of the Ure.

“ From the remarks of Messrs. Borrer and Watson in the Supplement to the ‘Cybele Britannica’ (iii. 359), it would appear that this species was really known to Smith, and included under his idea of *H. denticulatum* ; but his descriptions would also apply to some of the forms of *H. prenanthoides*, as defined by later British authors, one of which (var. *paucifolium*, Fr.) is figured in ‘English Botany’ (2235), under the name of *denticulatum*. Such being the case, surely it is better to avoid confusion by discarding that name, as loose and uncertain in its application, and using in its place that proposed by

Fries, which has never been employed otherwise than to designate the true *H. denticulatum* of the three editions of Babington's Manual, and is therefore definite, and easily understood.

"Though most probably a permanent species, this is too little known by the botanists of this country for any sketch of its distribution to be attempted. Most likely it will be found, like many others of the same genus, geographically allied to its natural associate, *H. prenanthoides*, and, like that species, attain its southern limit in superagrarian Yorkshire. It has been so much mixed up with other species, that it is impossible to speak with certainty; but I believe this is the first notice of its occurrence in England."

Correction of a previous Error.

"I am kindly informed by Mr. H. C. Watson, that the *Serrafalcus* so plentiful, last autumn, on the Middlesbro' ballast-hills, as mentioned in a former number (*Phytol.* iv. 721), is probably rather *arvensis* than *patulus*. The two species are very nearly allied in habit; but the latter is described as distinguished by its broader spikelets, unequal paleæ, and shorter anthers. It is practically known to few botanists as a plant of Britain. Another species, closely resembling that which I collected, is reported to occur occasionally on ballast at the same locality. Perhaps that may be true *patulus*: also *Digitaria humifusa*; but I have not been able to find either of them. I may also take this opportunity of mentioning, that, upon receiving specimens of the mosses, collected with *Cyperus fuscus* at the Codhill locality, I find the *Hypnum* named *nitens* is really *rufescens*, a species more boreal in its localities."

Effects of the Mildness of the present Season.

The President read the following note, from Mr. John Lloyd, dated Wandsworth, January 24, 1853:—

"The annexed list of British plants have all of them been observed in bloom, by myself, since the 1st of the present January, and, with very few exceptions, in the neighbourhood of Clapham and Wandsworth, where the soil is light, and the subsoil gravel. Some of them are cultivated; but they will be found to be such as have their habitats in warm, sheltered situations, where we may reasonably expect that they are in bloom at the present time. I have rejected all cultivated alpine, for, although many of them are in bloom here, we cannot expect that they are so in their mountain homes, where the surface of the ground is probably covered with snow. It will be seen that it

is more like a list of autumnal plants protracted in their blooming, than of vernal ones which have come prematurely into flower. In elucidation of this view, I may observe that a considerable number of the plants belong to the Compositæ, and the greater part of this order are autumnal; and I may also mention that, in the large open field opposite to the burying-ground at Wandsworth, there was, at the beginning of the month, a great number of *Ranunculus bulbosus* in bloom; but these have gradually decreased to the present time. By the side of the same field, on a sheltered bank, *Ranunculus Ficaria* grows; but, although this is one of our earliest plants, and a purely vernal one, it is not yet in bloom.

"The present season may be considered as the mildest since the commencement of the present century; and I can only find one instance of anything like it in the records of the last. The Rev. Stephen Hale, in his 'Statistical Essays,' fourth edition, 1769, vol. i. p. 69, publishes an account (which he had from Philip Miller) of the winter of 1724, in which occurs the following paragraph:—'The Spring was so forward in January that the Snowdrops, Crocus's, Poleyanthus's, Hepatica's, and Narcissus's were in flower, and it was remarkable that most of the Cauliflower Plants were destroyed by the mildew.' Now, I think we may infer from this, that the weather was something like what we are experiencing in the present season, for, if there had been a few sharp frosts in November or December, 1723, the mildew would have been materially checked, if not destroyed.

"*Ranunculus bulbosus*

" *repens*

**Alyssum maritimum*

Capsella Bursa-pastoris

**Brassica oleracea*, var. *Cape broccoli*

Sinapis arvensis

Raphanus Raphanistrum

Sisymbrium officinale

**Cheiranthus Cheiri*

**Viola odorata*

" *tricolor*

Malva sylvestris

Cerastium vulgatum

Stellaria media

**Hypericum calycinum*

Arenaria rubra

Geranium molle

Geranium rotundifolium

* *nodosum*

Ulex europæus

" *nanus*

Æthusa Cynapium

Anthriscus sylvestris

Galium Aparine

Erigeron Canadensis

Senecio vulgaris

" *Jacobæa*

Bellis perennis

Chrysanthemum Parthenium

Anthemis Cotula

" *nobilis*

Achillea Millefolium

Sonchus oleraceus

Leontodon Taraxacum

* Cultivated.

Hieracium Pilosella
Hypochaeris glabra
 " *radicata*
Cichorium Intybus
 **Fragaria vesca*
Borago officinalis
 **Pulmonaria officinalis*
Plantago major
 **Arbutus Unedo*
Vinca major
 " *minor*
 **Primula vulgaris*
Anagallis arvensis
Veronica agrestis
 " *arvensis*
 " *hederæfolia*
Linaria Cymbalaria

Lamium album
 " *purpureum*
 * " *maculatum*
 " *incisum*
 **Daphne Mezereum*
 * " *Laureola*
Rumex Acetosella
Urtica urens
Euphorbia helioscopia
 " *Peplus*
Mercurialis annua
 **Corylus Avellana*
Ruscus aculeatus
Poa annua
Hordeum murinum
 **Galanthus nivalis*
 (67 species).

The following remarks, by Dr. Salter, in a letter in the 'Isle of Wight Observer,' refer to the same subject:—

"At the present time, the effects of the mildness of the temperature on the vegetable kingdom are yet more remarkable than on the animal. For nearly a month past, primroses have been blossoming on the banks, and the green-swards have been bespangled with daisies, while *Ulex europæus* is getting quite yellow with the abundance of bloom. Not to dwell particularly on each, I would enumerate the following, which, within the last few days, I have observed in flower in the fields, woods, and hedges, *viz.*, *Ficaria verna*, several species of *Ranunculus*, *Sinapis arvensis*, *Cardamine hirsuta*, *Lychnis diurna*, *Stellaria holostea*, *S. media*, *Arenaria trinervis*, *Cerastium viscosum*, *Fragaria vesca*, *Potentilla Fragariastrum*, *Heracleum Sphondylium*, *Torilis Anthriscus*, *Sonchus arvensis*, *Lapsana communis*, *Pyrethrum inodorum*, several species of *Senecio*, *Anagallis arvensis*, and *Linum angustifolium*. Of shrubs and trees I may state that the honeysuckle and elder are in leaf. In one hedge I saw a few hawthorn-leaves; here and there was one bush which had sprouted to the length of three inches. The oaks, elms, and hazels have already an altered tint, from the swelling of their buds. On the banks, the leaves of the wild *Arum* are already developed; and in the hedges *Rubia peregrina* is grown to several inches.

"In the gardens, there are in blossom several varieties of roses; also *Arbutus*, *Laurus-tinus*, *Coronilla*, a species of *Acacia*, violets (double and single), daffodils, periwinkles, anemonies, *Hepatica*, snow-drop, stock, scarlet geranium (*Pelargonium*), *Omphalodes verna*, *mignonette*, *Petasites fragrans*, *Sphenogyne speciosa*, scabious, and

others. Fuchsias and *Eccremocarpus* are sprouting; and the *Clematis* in many instances has grown more than a foot in length. Potatoes are in many places a foot in height, and *Tropæolum* continues growing. In a pond about a mile from Ryde, that rare, and beautiful, and deliciously scented aquatic, *Aponogeton distachyon*, is at present blooming to perfection.

"It is, I think, usual in this district, for many of the above to sprout, and occasionally to bloom, in winter; but I never before knew vegetation quite so active as it is at this season."

MICROSCOPICAL SOCIETY OF LONDON.

October 27, 1852.—George Busk, Esq., in the chair.

A paper by Joseph Delves, Esq., 'On the Application of Photography to the Representation of Microscopic Objects,' was read.

After some preliminary observations, the author stated that the only arrangement necessary for the purposes of photography is the addition to the microscope of a dark chamber, similar to that of the camera obscura, having at one end an aperture for the insertion of the eyepiece, and at the other a groove for carrying the ground glass plate. This dark chamber should not exceed eighteen inches in length, as, if longer, the pencil of light transmitted by the object-glass is diffused over too large a surface; and a faint and unsatisfactory picture is the result. Another advantage is, that pictures at this distance are in size very nearly equal to the object as seen in the microscope. The time of producing the picture varies from five to fifteen seconds. The author also made some remarks upon the mode of manipulating, and concluded by calling attention to some very beautiful specimens that were afterwards presented to the Society.

Errata in a previous Number.

Mr. Maw wished to have the following errors corrected, which occur in his paper at page 785:—Page 785, line 8 from bottom, for "at" read "of;" page 786, line 4 from bottom, for "areas" read "axis;" page 787, line 6 from top, for "entering" read "resting;" page 792, line 20 from top, for "Forthelsloch" read "Frithelstock;" page 794, line 13 from top, for "Witham" read "Northam;" page 794, line 14 from bottom, for "Barnstaple" read "Bideford."

Extracts from the 'Proceedings of the Linnean Society.'

(Continued from page 832).

On the Forest-Trees of British Guiana, and their Uses in Naval and Civil Architecture ; by Sir Robert H. Schomburgk, Ph.D. &c.

The trees are mostly indicated by their colonial names, but to many of them Sir R. Schomburgk has been enabled to add their scientific designation.

Souari, Sewarri or Sewarra (*Pekea tuberculosa, Aubl.*). Of large size and very abundant ; excellent for ship-building, mill-timber and planks, and may be obtained from 20 to 40 feet long, and from 16 to 20 inches square.

Siruaballi, Sirwaballi, Siverballi. There are four varieties or perhaps species of this tree, which belongs to the family of Laurineæ. They are distinguished as black, brown, yellow and white Siruaballi. Its spicy smell and bitter taste preserve it from the attacks of worms, either in or out of water, on which account it is in great request for planking colonial crafts.

Dakumballi. Grows on the side of rivers, and is not much used.

Marsiballi or Accuribroed. A tall straight tree, but not of large size. Wood hard and strong, but not very durable when exposed to alternations of wet and dry weather, for which reason it is only used in house-framing and inside work. When dried it is frequently used for torches.

Turanira or Bastard Bully-tree. Tall, straight, of large size, and abundant on the banks of the Demerara River. Makes good planks and framing-timbers for inside work, but is not durable when exposed to the weather.

Suradani or Suridani. Plentiful and of large size ; principally in request for planks and timbers of colony crafts. It is of a light red colour.

Kautaballi or Kutaballi. Grows chiefly on the sand-hills which form the first elevations on receding from the sea-coast. Very hard, and much used for beams and inside work, but not durable when exposed to the weather.

Cakaralli or Kukaralli. Mostly found on rising ground along the banks of rivers, and belongs to the tribe of Lecythideæ. Its straightness and large size (from 30 to 40 feet long and from 6 to 14 inches square) would qualify it for masts or spars for colony crafts ; but its

heaviness militates against this use. It is very durable and chiefly used in house-framing; but as it is said that barnacles do not attack it, it is also employed in wharfs, &c. The bark is easily stripped off, and consists of numerous layers, which the Indians separate by beating with a stick, and the author has counted as many as seventy of these layers in a strip of bark. When separated they have the appearance of thin satin paper; they are dried in the sun, and used as wrappers for cigars.

Simaruba, or *Sumaruppa* (*Simarouba amara*, Aubl.). Grows on hill-sides to the height of 50 feet, branching and somewhat crooked. The wood resembles white pine, both in colour and quality, and makes good boards for inside work. A decoction of the bark, which is intensely bitter, is considered an excellent remedy in dysentery and other complaints of the bowels, and is much used among the Indians.

Yahou. Grows in valleys in rich soil, and is much used for the staves of casks, &c.

Wallaba (*Eperua falcata*, Aubl.). In great abundance along the banks of rivers, reaching 40 feet in height, and being often 2 feet in diameter. Bark reddish brown, with a thin white sap, enclosing a wood of a deep red colour frequently variegated with whitish streaks. It is hard, heavy and shining, and impregnated with an oily resin, which makes it very durable both in and out of water. It splits very easily, and is consequently generally used for palings, shingles and vat-staves, and also for posts and uprights in framing. The bark, which is somewhat bitter, is a good emetic, which is much used by the Arawak Indians in a decoction.

Curahuri or *Kurukuru*. Tall and straight. Wood used for framing, boards and planks.

Curana, *Samaria*, *Acuyari*, *Mara*, or *Cedar-Wood* (*Icica altissima*, Aubl.); two varieties, as they are considered by Aublet, one having red wood and the other white. The red cedar is found only in the interior, growing to 60 or 70 feet and even higher, and from 4 to 5 feet in diameter. It has a strong aromatic smell, and is much in request for inside furnishing, bookcases and shelves, as it is found to preserve books and papers from injury by insects, and is also light, easily worked and not liable to split. Its great height would qualify it for masts, and the Indians prefer its trunk to that of any other tree for preparing their canoes. One of those employed by the author during an expedition into the interior, which was 42 feet long and 5½ feet wide, was hollowed out of a single trunk of this tree, and was

found at the end of four years' service, having previously been much used, to be as sound as when bought for the expedition, although it had been in both fresh and salt water, and hauled over land and cataracts in the interval.

Itaballi or *Copai-yé* of the Macusi Indians (*Vochy Guianensis*, *Aubl.*). From 50 to 60 feet high, and from 2 to 2½ feet in diameter. Wood hard, but not very durable when exposed to the weather; chiefly used for inside work, staves for sugar-hogsheads, boat-oars, &c. Flowers of a beautiful yellow, highly odoriferous and very ornamental.

White Siruaballi. A tall tree; wood much lighter than the brown Siruaballi previously mentioned, but not so much esteemed.

Curata-yé of the Macusis (*Curatella Americana*, *L.*). A crooked tree, seldom more than 12 feet high, with crooked and tortuous branches, and a thick rough bark which frequently peels off in large flakes. The crooked branches are much used by the Indians for their canoes, and might serve for military saddles. It grows only in the Savannas of the interior. The leaves, which are scabrous, are used by the Indians like sand-paper to polish their blow-pipes, bows, war-clubs, &c.; and the blow-pipe being called *Cura*, the tree has thence received the name of *Curatakié*.

Burracurra, *Paira*, *Letter-wood*, or *Snakewood* (*Piritanera Guianensis*, *Aubl.*). This tree, which is very scarce within several hundred miles of the sea-coast, is often from 60 to 70 feet high, and from 2 to 3 in diameter. The bark is of a dark gray, and when wounded exudes a white milk. The outer part of the wood is white and very hard; the heart (which in the largest tree scarcely exceeds 6 or 7 inches in diameter) is of great weight, hardness and solidity, of a beautiful deep red, variegated with black spots of different size and figure, which give rise to its name. It is susceptible of a brilliant polish; but the small size of the mottled part, and its great value even in the colony, limits its use almost entirely to veneering, to picture-frames, to some smaller pieces of furniture, and to walking-sticks. The Indians form it into bows more for ornament than use. At the foot of the Canuku Mountains near the river Rupununi, at the Upper Essequibo, and Corentyn, it is still plentiful; but all these places being several hundred miles from the sea-coast, it is both difficult and expensive to convey it to the colony. There appears to be a variety, the heart of which is not mottled, and this the Indians are said to prefer to the other for their bows.

Wamara. A scarce tree, attaining a great height, but the only

part used is the heart, which is dark brown and often streaked. Its hardness and weight cause it to be preferred by the Indians for their war-clubs; it may be had from 6 to 12 inches square, and from 20 to 40 feet long.

Cuppa, Ruyé (*Clusia* sp. ?). A tree of large size, with a hard wood used for inside work.

Curahara or *Kurara*. Plentiful and of large size; and its durability, and not being liable to split, recommend it chiefly for timbers, knees, &c. for schooners. It is also much in request for mill-rollers, mill-timbers and planks of every description.

Yarura, Porreka-yé, or Paddle-wood (*Aspidosperma excelsum, Benth.*). The lower part of the trunk juts out in tabular projections, forming cavities or compartments like the *Mora*, which serve the Indians as ready-made planks, principally for the construction of their paddles. The trunk itself has the appearance of being fluted, or as if it consisted of numerous slender trees grown together along their whole length. The author states that he knows only of one other similar instance among the forest-trees of British Guiana; in this latter case the tree produces berries, while the fruit of the *Yarura* is a follicle containing several suborbiculate winged seeds, attached by a long funiculus. The wood of the *Yarura* is light, elastic, and not apt to splinter; it might prove useful for gun-carriages, bulwarks of vessels of war, &c.; and might also, on account of its lightness, be employed in floats or paddle-wheels of steam-vessels. It is much in request for rollers in the cotton-ginning machines, for which purpose it is superior to any other wood in the colony.

Purple-heart, or Mariwayana (*Copaifera pubiflora, Benth., and Cop. bracteata, Benth.*). Rather scarce in the Coast Region, being found in the mountainous tracts above the Cataracts. There are several varieties or species, but all much alike, possessing great strength and elasticity, and used for furniture, on account both of their colour and durability. Used also for mortar-beds, being superior to any other wood in sustaining the shocks produced by the discharge of artillery. The author was assured by Col. Moody, R.E., that the Black Green-heart and the Purple-heart were the only woods that stood the test as mortar-beds at the siege of Fort Bourbon, in the Island of Martinique. One variety (*Cop. bracteata*) is very common in the Savannahs near the rivers Rupununi, Takutu, and Branco; but this is of small size compared with the others. The natives use the bark taken off entire with the ends sewn together, and strengthened by a slight frame-work, for river canoes.

Mapurakuni, or *Maipayé*. The bark is used by the Indians for colouring their arrow-points and pottery, as it produces a fine red colour when steeped in water and mixed with Currawéru. It is a large forest-tree.

Burueh, *Bully*, or *Bullet-tree* (*Mimusops* sp.). A tree of the largest size, often 6 feet in diameter, and having the trunk destitute of branches nearly to the top. Leaves, branches and trunk producing a whitish milk; fruits the size of a coffee-berry, and when ripe very delicious. Wood extremely solid, heavy, close-grained and durable; dark brown, variegated with small white specks; chiefly used in house-framing, for posts, floors, &c., as the weather has but little influence on it, but also esteemed the most valuable timber for the arms, shafts, &c. of windmills. It squares from 20 to 30 inches, and may be obtained from 30 to 60 feet long. In salt or brackish water it is sure to be attacked by the worms. A tree cut down by the author at Cuyuni, measured 67 feet to the first branches, and thence to the top 49 feet—in all 116 feet.

Payou-yeh (*Etaballia Guianensis*, *Benth.*). A tree growing only near the Upper Essequibo and very abundantly along the Rupununi and Takutu, the heart of which is highly ornamental, but not more than 6 inches in diameter, and very subject to holes.

Maipurému (*Vantanea Guianensis*, *Aubl.*). Wood very subject to worms, and not likely to become of much use; but the tree presents a beautiful appearance with its large clusters of pink flowers, and is even more remarkable for its drupaceous fruit, which is furrowed like our peaches and almonds, and is cut in half by the Indians to form ornaments, chiefly for the children.

Camara, *Camacusack*, *Makoripong*, or *Ackawai-Nutmeg* (*Acroclidium Camara*, *Schomb.*). Timber most like the *Siruaballis*, aromatic and bitter, and consequently resisting worms and insects. Trunk 40 or 50 feet high, with a circumference of 8 to 10 feet, and apt (like the *Yarura* and *Mora*) to form tabular projections at the lower part. Chiefly prized for its aromatic fruit, which is considered one of the most efficacious remedies in colic, diarrhoea and dysentery.

Greenheart, *Sipiri* (*Nectandra Rodiæi*, *Schomb.*). The brown Greenheart is one of the most useful timber-trees of the colony, and is found in great abundance within 100 miles of the Coast Region. It grows to the height of about 60 feet, and is generally used for house-frames, wharfs, bridges, piles and planks. Within the last twenty years a large quantity has been imported into Liverpool and Greenock; and it has been even asserted that in strength and durability it is

superior to English oak, than which it commands a higher price. In times of scarcity the Indians obtain from its fruit, grated and macerated in water, a *fecula* which is mixed with the rotten wood of the Wallaba-tree, pounded, sifted and baked into bread, in like manner with the Cassava. In the bark and also in the fruit, Dr. Rodie of Demerara has discovered a substance which forms an excellent substitute for quinine, and to which he has given the name of *biberine*. The black greenheart appears to be a mere variety.

Cartan-yeh of the Macusi Indians, *Pao da Rainha* of the Brazilians. Apparently restricted to the Savannahs in the neighbourhood of the rivers Rupununi, Takutu, Branco, &c. The Brazilian name is derived from the red colour of the wood, which resembles that of the Brazil-wood of Pernambuco, to which the same name (Queen's-wood) is applied. It reaches a height of 80 to 100 feet; and being easily worked and of a handsome colour, promises to become of great interest to cabinet-makers. It was used by the author during his sojourn in Pirara for temporary tables, and the large size of its planks induced the military commandant to construct of it a temporary bridge across the river. The leaves are impari-pinnate, the flowers papilionaceous, and the fruit a samara with a prickly capsule, the wing being from 4 to 5 inches in length.

Sarabadani. Much used for furniture. It grows to a large size, and is chiefly found in swampy soil and along the banks of rivers.

Ducaballi, or *Guiana-Mahogany*, is very scarce, and is almost regarded as superior to mahogany, whence it is chiefly employed for furniture and commands a high price.

Waranana, or *Wild Orange*. A large timber-tree, which grows chiefly along the banks of the rivers Pomeroon, Supinama, &c. Much used for boat-oars and staves for sugar-hogsheads. Its fruit resembles an orange, but is not eatable.

Ducaliballi. Grows to a pretty large size, but is not plentiful; the trunk is about 40 feet high, but seldom exceeds 20 inches in diameter. Wood deep red, finer, more equal and more compact than mahogany, and like the *Ducaballi* much used for furniture. Takes a fine high polish, and resembles or perhaps is identical with the Brazilian Beef-wood.

Haiawaballi, or *Zebra-wood* (*Omphalobium Lamberti*, Dec.). Grows to a large size, but is very scarce. Wood of a light brown with darker stripes, and considered the handsomest furniture-wood of the colony: it is easily worked and makes beautiful bed-posts.

Hubaballi. A light brownish wood, beautifully variegated with

black and brown streaks; easily worked, takes a fine high polish, and makes beautiful furniture, and cabinet-work of every description. May be had from 6 to 15 inches square and from 20 to 35 feet long. It is by no means scarce, but is much subject to holes, which frequently render it useless.

Simeri, or *Locust-tree* (*Hymenaea Courbaril*, L.). A tree of large size and plentiful throughout Guiana, often attaining from 60 to 80 feet in height and 8 to 9 feet in diameter. Trunk destitute of branches nearly to the top. Wood close-grained, of a fine brown, streaked with veins, and well adapted for mill-timbers, as it does not split or warp. A good deal of it is sent to England to be used as trenails in planking vessels, and in beams and planks for fitting up steam-engines: it has also been found to answer well for the frames, wheels, &c. of spinning machines. The Indians and Negroes are fond of the farinaceous saccharine pulp enveloping the seeds. The gum, which resembles Copal, and produces an excellent spirit-varnish, is found about the roots of the old trees a few inches under the surface of the ground, and occasionally also exuding from the trunk.

Yari-Yari or *Lance-wood* (*Duguetia Quitarensis*). Is abundant in the interior; but the trees are seldom above 20 feet high clear of the branches, or more than 5 inches in diameter. It is considered by the coach-makers, in consequence of its elasticity and toughness, the best material for chaise or gig shafts.

Black Greenheart is only distinguished from the common Greenheart by the colour of the wood, but is so scarce in proportion to the brown, that not more than one in twenty of the trees cut down are found to belong to this variety. The wood is in great request in the island, being preferred to all others, on account of its well-known durability, for windmill-shafts, spindles and mill-work in general.

Itaka or *Itekitibouraballi* (*Machærium Schomburgkii*, Benth.). Wood much used for furniture: it has streaks of black and brown throughout, the outer part being pale yellow. It is not scarce, but rarely squares to more than 14 inches, and is very subject to heart-shakes. Its purple flowers have the odour of violets.

Ebony, or *Banya*. A large tree of fluted surface and uneven growth, the heart of which (seldom more than 8 to 10 inches square) is alone used: it is black, heavy, hard, and strong, and generally used by the Indians for their war-clubs.

Mora (*Mora excelsa*, Benth.). The most majestic tree of the forests of Guiana, towering over all the rest and often reaching the height of 120 feet. It is abundant along the rivers of the Coast Region, and

extends as far south as lat. 3° N. The wood is close, cross-grained, and difficult to split: it is considered by the most competent judges to be superior to oak (as it is not subject to dry-rot) and the very best wood that can be procured for ships' timbers. It may be obtained from 10 to 20 inches square, and from 30 to 40 feet long; and its branches having a tendency to grow crooked it affords natural knees, while the trunk may be used for keels, beams and planking. A full account of this useful tree was published by Mr. Bentham in the Society's 'Transactions,' vol. xviii. p. 207.

Note on the Occurrence of an Eatable Nostoc in the Arctic Regions and in the Mountains of Central Asia; by J. D. Hooker, M.D., F.R.S., F.L.S. &c.

Dr. Hooker states that on the return of Captain Penny's Expedition from the Arctic Regions, Sir W. Hooker received from Mr. Sutherland a small collection of Cryptogamic plants, among which was one, apparently referable to *Nostoc commune*, which he described as being found in great abundance upon the floating and fixed ice in Wellington Channel, occurring in detached masses drifted about by the wind, forming the only vegetable production of any importance over many square leagues, and affording shelter to *Poduræ*, with other Crustacea and some insects. In the neighbourhood of their winter quarters on Cornwallis Island, lat. 75° N., long. 95° W., it was so plentiful that it might be taken advantage of as food, and prove a material addition to the resources of the country in cases of extreme want. Mr. Sutherland added that he had eaten handfuls of it on several occasions, without any inconvenience; and although it was generally infested with swarms of the larvæ of flies and gnats, as well as with myriads of very active *Poduræ*, he considered it much more nutritious and agreeable than the "*tripe de roche*," and perhaps not inferior to "Iceland Moss." On showing the plant to Dr. Thompson, he drew the attention of Dr. Hooker to a very similar plant which occurs in great abundance in Western Thibet, floating in large masses on the surface of pools and lakes in soils impregnated with carbonate of soda, and of which heaps are drifted by the winds upon their banks. It occurs as high up as 17,000 feet, and is of a green or pale purple colour; and this too appeared to Dr. Hooker to belong to *Nostoc commune*. Samples of both were forwarded to Mr. Berkeley, whose notes to the following effect were also laid before the Society.

Mr. Berkeley states that he has been unable to find any account of the chemical constituents of *Nostoc*. The chemical condition of such species as he had been enabled to examine, under the influence of iodine and sulphuric acid, seems to vary not only in the different species, but in individual specimens, and even in parts of the same specimen. In some the gelatinous matter and the chains of spores assume a more or less deep tint of violet, indicating that the greater portion consists of cellulose, perhaps in some cases partially changed to dextrine by the action of the sulphuric acid; while in other cases the prevailing tint is yellow-brown, indicating rather bassorin. No purple tint occurs where merely iodine is used, and the change therefore is not due to the presence of amyllum. In fresh specimens of *Nostoc commune*, the spores assume a beautiful green tint, which is probably due to the combined tint of the yellow protein contents of the cells and the blue cellulose of which their wall is formed. In the Arctic specimens, and in English *Nostoc commune*, the bassorin tint prevails, while in specimens from Thibet (probably *Nostoc salsum*, Kütz.), gathered by Dr. Thomson, in pools of water where the soil is covered with an efflorescence of carbonate of soda, cellulose is indicated, but with every intermediate shade. Mr. Berkeley has, however, found that in woody fibres which in bleaching have been exposed to salt water, a deeper purple tint is assumed than when they have been bleached by rain water, so that something may possibly be due to the peculiar place of growth of the Thibetan species. In *Nostoc edule* the yellow-brown tint is stronger than in any other specimen examined; but it is scarcely probable that any very constant chemical characters will be found to prevail in the different species. In either case there would be a very nutritious food, and one from its gelatinous condition probably easily assimilated. The habit of the Arctic species is exactly that of *Nostoc commune*, and Mr. Berkeley would not hesitate to regard it as identical, if there were no other difference than a little increase in the relative size of the threads of spores; but in parts of the fronds the chains are surrounded by a distinct gelatinous envelope, presenting an appearance somewhat similar to that of toad-spawn, which is very visible in a transverse section. At a later period, when the chains are ready to break up at the connecting joints, no trace of this envelope is to be detected, and the plant then exhibits the true characters of *Nostoc*. It appears indeed, from the remarks of Thuret, that when the threads of *Nostoc* are first generated from the large connecting bodies, there is really such an envelope; but this exists in *Nostoc*, as far as is at present known,

merely in the infant state; and consequently if the genus *Hormosiphon* is to be retained, the Arctic species must be regarded as belonging to it, for no such appearance has been detected by Mr. Berkeley either in dried or freshly-gathered specimens of *Nostoc commune*. It is possible that more extended observation may show that this character is not of the consequence attributed to it by Kützing; but in the mean time Mr. Berkeley characterizes these specimens as—

HORMOSIPHON ARCTICUS, foliaceo-plicatus viridis vel fuscescens, filis demùm (gelatinâ diffusâ) liberis.

Fronds foliaceous, variously plicate, sometimes contracted into a little ball. Gelatinous envelope at length effused; connecting cells at first solitary, then three together; threads (which are nearly twice as thick as in *Nostoc commune*) breaking up at the connecting cells, so as to form two new threads, each terminated with a single large cell, the central cell becoming free. Of these threads and of their gelatinous envelope Mr. Berkeley gives figures.

With regard to the Thibetan *Nostoc*, Mr. Berkeley adds that a species of this genus, as is well known, is a native of Tartary and is eaten abundantly in China. There is a box of it, sent by Mr. TraDESCANT Lay, in the Museum of the Linnean Society; and mention is made of it by M. MONTAGNE in the '*Revue Botanique*,' ii. p. 247, as having, in the form of a soup, made part of a dinner given by the Mandarin Huang at Macao, to several members of the French Embassy. The Mandarin described it as a freshwater plant, growing in Tartary in streams and running water, and sold at Canton in small boxes: it is highly esteemed by the Chinese, and not very expensive. At this time M. Montagne regarded the species as *Nostoc cæruleum*, but specimens sent him by Mr. Berkeley proved it to be distinct, and it was afterwards published in the '*Revue Botanique*' under the name of *Nostoc edule*, *Berk.* and *Mont.*, and figured by Kützing in his '*Tabulæ Phytologicæ*.' In the last-named author's '*Species Algarum*,' it is said to have been gathered by Gaudichaud, who, although a great traveller, was certainly never in Tartary. The Thibetan *Nostoc*, like the Arctic, is probably quite as good as the Tartarian. After some further notes on the chemical changes produced in this plant and in *Nostoc commune* when treated with iodine and sulphuric acid, and a reference to a passage in Kützing's '*Grundzüge der Philosophische Botanik*,' where he speaks of these plants as consisting in great measure of gelatin (a substance belonging to the same category as bassorin, and perhaps a modification of it), Mr. Berkeley concludes

by stating that a thin slice of gum tragacanth, treated with iodine and sulphuric acid, assumes after a time the same tint as the Nostoc. He believes, however, that starch is often present in gum tragacanth, which is not likely to be the case with the Nostoc; and thinks we may safely assume the jelly of Nostoc to be a state of bassorin, passing into cellulose or dextrine.

Localities for Plants near London, in 1852.

By J. T. SYME, Esq.*

LAST summer I had an opportunity of examining pretty carefully the Flora of the metropolitan district, as I devoted to this object the three days of the week on which I was not engaged at the rooms of the Botanical Society. I shall now bring forward the results of these excursions, as I think they may be interesting, on account of the verification I have been able to afford to stations for rare plants which have not, I believe, been recorded on recent authority. Of course, plants *new* to the district were scarcely to be hoped for; and the few I shall mention are critical species, which have no doubt been passed by as allied and well-known species.

Ranunculus fluitans, Lam. Plentiful in the Wey, at Godalming.

Ranunculus cœnosus, Guss. On Woking Common, in some of the ponds made in excavating material for the approaches to the bridges over the Basingstoke Canal.

Ranunculus hirsutus, Curt. Very luxuriant on the Plumstead practice-ground, at the station for the Polypogons.

Papaver somniferum, L. Plentiful, as a weed, in corn-fields near Greenhithe; Boxley, and between Halling and Cobham.

Fumaria micrantha, Log. Near Northfleet; Epsom.

Fumaria parviflora, Lam. Cuxton; Halling; Boxley.

Fumaria Vaillantii, Lois. A single specimen on the Hogsback, near Compton chalk-quarries, Surrey.

Brassica Napus. Very abundant on the bank of the Thames, from Putney upwards. My reason for mentioning this plant is, that *B. campestris*, which I could not find, is said to grow there. Is this a mistake? The plants are very difficult to distinguish, unless the root-leaves are examined. These are quite glabrous in the Thames-side plant.

* Read before the Botanical Society of London, February 4, 1853.

Polygala calcarea, Schultz. Very fine near Pangbourne, Berks; not unfrequent on the Hogsback, at and near Compton chalk-quarries. Flowers blue, white, or pink.

Geranium rotundifolium, L. Abundant in one locality at Battersea.

Trigonella ornithopodioides, D.C. Plumstead Common, scarce.

Poterium muricatum, Spach. Near Goring, Oxfordshire.

Sedum sexangulare, L. Garden-wall at Sydenham, of course not indigenous.

Petroselinum segetum, Koch. Lane at Charlton Church; near Eltham; between Greenwich and Woolwich; and near Orpington.

Coriandrum sativum, L. Thames-side below Greenwich. Mr. Irvine found it at Battersea and Wandsworth.

Tragopogon pratensis, L. With florets exceeding the phyllaries, at Sydenham. At Greenwich it occurs with florets equal to, and half the length of, the phyllaries, and in all intermediate states. *T. minor*, Fr., can scarcely be separated, even as a variety.

Lactuca virosa, L. Between Greenhithe and Darenth Wood.

Sonchus palustris, L. I searched in vain for this fine species in the Isle of Dogs, and between Greenwich and Woolwich. Mr. Irvine and I failed to find it at Halling, where the former saw it many years ago. Mr. Irvine could not see it in the railway cutting on Wandsworth Common, where it is recorded by Mr. M'Ennes (*Phytol.* iv. 398). Mr. Kippist informs me he found it, in 1829, about Deptford, and it may still grow there. If not, I fear it must be expunged from the metropolitan Flora.

Crepis biennis, L. Northfleet and Greenhithe chalk-pits; near Cobham, Rainham, Rochester, and Gravesend.

Hieracium vulgatum, Fr. The form called *H. maculatum* by Smith occurs on a wall at Sydenham.

Borkhausia fœtida, D.C. I looked very carefully for this plant in the stations recorded for it, but in vain. I fear it is now extinct. The following species has probably been mistaken for it in some of the localities given for it.

Borkhausia taraxacifolia, D.C. Very abundant in all the chalky districts of Kent.

Carduus acaulis, L. Specimens from the road-side between Darenth and Dartford had branched stems above a foot high.

Pulicaria vulgaris, Gært. Has disappeared from Golder's Green, where it was carefully sought for, by Mr. Irvine and myself.

Verbascum nigro-Lychnitis. At Green-street, Green, near Farnborough, Kent, along with *V. nigrum* and *V. Lychnitis*. *V. Lychnitis* also occurs near Cuxton.

Linaria vulgaris, var. *speciosa*, Ten. A plant agreeing pretty nearly with that found in the Isle of Wight by the late Dr. Bromfield, grows in a chalk-pit near Northfleet.

Melissa officinalis. L. Between Richmond and Kew, in considerable quantity.

Lithospermum purpureo-cæruleum, L. In an excursion to Darenth Wood, last July, Dr. J. A. Power and I found this plant in considerable abundance, but mostly without any signs of having flowered.

Chenopodium rubrum, L. A prostrate form, with entire leaves and large seeds, is common below Gravesend. This is probably the same as that found by the Rev. W. A. Leighton, recorded in the 'Manual of British Botany.'

Chenopodium hybridum, L. Still abundant near Northfleet; Charlton; Battersea.

Chenopodium ficifolium, Sm. Very plentiful near Notting Hill; Battersea; Greenwich. In 1850 I saw it about Hampstead.

Atriplex littoralis, L., and *A. marina*, L. The former below Gravesend, and the latter all along the banks of the Thames from Greenhithe to Stroud. There seems to be no character by which these plants can be distinguished, except the leaves, as open and closed perigones occur on the same specimen.

Polygonum mite, Schrank. Battersea. Here I also found a plant intermediate between *P. mite* and *P. Persicaria*.

Rumex pratensis, M. & K. Near Cuxton, Kent; about Thames Ditton and Moulsey, Surrey; between Hampstead and Camden Town.

Rumex maritimus, L. Putney Heath; Battersea fields? on the mud taken from the bed of the river; (the plant was rather too young to be determined quite satisfactorily).

Rumex palustris, Sm. Still grows at Hampstead; Notting Hill; Isle of Dogs; Battersea; Thames-side near Charlton.

Populus canescens, Sm. Epping Forest, at Wanstead.

Orchis militaris, L. This fine species still grows, but very sparingly, between Pangbourne and Stratley, Berks.

Orchis simia, Lam. Edges of fields between Goring and Mapledurham, Oxfordshire. Babington says, "*Helmet dark purplish*." It was pure white in all the specimens I found. Neither this nor *O. militaris* appears now to grow in the vicinity of Cavesham.

Leucojum æstivum, L. Last autumn, on passing the station for this plant opposite Blackwall, I found it covered with mud from the river, to the depth of at least three feet. I therefore fear that we shall see no more of this beautiful species in the station where it has maintained itself for so long a time.

Allium Scorodoprasum, L. I believe I saw this plant last July, about two miles below Gravesend, growing on the landward side of the ditch by the river-side. The ditch was too wide to leap across, and too muddy to wade through; so I was unable to get close to it; but I know no plant I could have mistaken for it, as I was within ten yards of it.

Anacharis Alsinastrum, Bab. The ditch by the Thames-side between Kew and Richmond is now full of this plant.

Echinochloa Crus-galli, Beauv. On the mud taken from the Thames, at Battersea, many plants of this species sprung up, but were buried before flowering, in the process of levelling the ground.

Setaria glauca, L. With the last, at Battersea. I found only a single plant; but Mr. Irvine observed it in considerable plenty.

Alopecurus fulvus, Sm. Epping Forest, near Wanstead; Putney Heath. Dr. J. A. Power finds it on Wandsworth Common.

Glyceria Borreri, E. B. S. Very plentiful on Plumstead practice-ground, with the Polypogons; Greenhithe to Gravesend.

Triticum laxum, Fr. Plentiful on the banks of the Thames and Medway. Resembles *T. repens* rather than *T. junceum*; but specimens from Ramsgate, collected by Mr. Moore, approach the latter.

Elymus geniculatus, Curt. I fear this plant must be erased from the British Flora. It certainly does not grow in the old station near Gravesend, where Mr. Irvine pointed out the locality to me where he had found it about thirty years ago.

Datura Stramonium, L. Near the windmill on Wimbledon Common.

Melittis parviflora, Lam. On the mud from the Thames at Battersea; on a new quay at Wandsworth, plentiful, but in company with *Plantago lagopus*, *Eruca sativa*, *Hibiscus Trionum*, and numerous other plants that have no title to be considered as even naturalized. Neither Mr. Irvine nor I could ascertain the source whence these had come.

J. T. SYME.

London, February 3, 1853.

Account of the Mosses and Lichens of the Malvern Hills.

By EDWIN LEES, Esq., F.L.S.*

THE Mosses, denominated by Linnæus "Servi," or humble hand-maids in the economy of Nature, have exercised a considerable agency in the accumulation of the soil now upon the Malvern Hills; doubtless, indeed, they were the primary originators of vegetation upon the bare rocks, whose hollows they have filled up in the lapse of ages with a soft spongy carpet, and so encompassed and obscured them, that numerous masses of gray rock, almost immersed in the verdant mossy inundation, now scarcely exhibit their points above it. The lichens have been generally considered as the first pioneers of vegetation, but their efforts to create a *humus* for the nourishment of other plants are but trifling when compared with the economical powers of the mosses. To test this by experiment, I took a tuft of *Bryum capillare*, Linn., from the roof of an outhouse at Malvern Wells, which was abundantly studded with it, together with the black earth collected about its base. The mass altogether weighed six ounces, but when after repeated and careful washings I had extracted all, or nearly all, the black mould that enveloped the roots, the actual residuum of frondescence that remained when weighed amounted only to half an ounce; thus satisfactorily showing that the moss, through atmospherical and imbral agency, had formed a soil exceeding its own weight at the very least above ten times! I had reason to believe, too, that this had been accomplished within three, or four years at most. By operations on a more extensive scale, it is easily conceivable how a bare mass of rock may, in the course of a few years, be covered with a thick coating of soil sufficient for the nourishment of any of the phanerogamous species, adapted to the climate and elevation where they may stand. *Bryum hornum* has been noticed to be a great accumulator of soil in marshy spots; while the excessive growth alone of such mosses as *Sphagnum palustre*, *Dicranum glaucum*, *Bryum palustre*, *Hypnum molluscum*, *scorpioides*, *cuspidatum*, &c., in the course of time entirely fills up bogs, drinks up their water, and conduces to their ultimate establishment as component parts of *terra firma*, fit for useful cultivation. In this manner, then, have the originally bare crags of the Malvern Hills received that rich *humus* now covering their sides, and which, combined with the disintegrating

* From 'The Botany and Geology of Malvern, by Edwin Lees, F.L.S.'

touch of Time's mouldering fingers, renders their soil in the present day capable of immediate cultivation even in the steepest places.

On a first cursory glance at the turf of the hills, there seems a great sameness in the mosses that luxuriate there, *Dicranum scoparium* and *undulatum*, *Hypnum triquetrum*, *splendens*, *purum*, and *molluscum*, with the *Polytricha*, seeming as if they had united to exclude the rest, *Hypnum triquetrum* especially everywhere predominating. However, a little attention will show a considerable variety, especially upon or in the immediate vicinity of the rocks, or on the margin of the numerous tinkling rills that show a cincture of the tenderest green wherever they trickle down. The apple-fruited moss (*Bartramia*) has a most elegant aspect seated among the deep crannies of the rocks, and the *Anictangium* quite covers some spots with its gray tresses; while a hoary aspect is given to the loose slabs in the upper ravines, bearded, as they become in decrepitude, with the woolly *Trichostomum lanuginosum*. Some of the mosses, of course, are rare or local; a few being confined to the limestone on the western side of the range.

The Malvern Hills are particularly remarkable for the various Lichens they produce; so that the late accurate cryptogamic botanist, Mr. Purton, has remarked in his 'Midland Flora,' that even in Wales he had scarcely observed any lichens that did not grow upon the Malvern Hills. Indeed, he might have stated the converse, for lichens grow here that I have not met with in Wales. Most of them grow in a very luxuriant and beautiful manner, and in the moist autumnal and wintry months many of the rocks present an appearance with their lichens truly gratifying to the lover of nature. Several northern and southern species seem here to attain their respective limitations, for on the same craggy rocks of the North Hill at Great Malvern are found the beautiful golden-hued *Borreria flavicans* and the dingy northern *Parmelia stygia*. Some of the harder granitic rocks are entirely covered with *Umbilicaria pustulata*, which in the spring is of an olive-green colour, and as flabby as a piece of moist leather, though in the summer months it appears black and sooty, as if subjected to the action of fire. On other rocks the deep purple *Parmelia omphalodes* extends itself, contrasted with wide patches of the gray *P. physodes*, the darker *P. saxatilis*, the dusky *P. olivacea*, or the conspicuous pitted thalli of *Sticta scrobiculata*. On the higher rocks the curled *Cetraria glauca* grows in abundance; while a remarkably hoary aspect is imparted to the protruding masses by the silvery *Isidium coralloides*, and the still more elegant coralline appearance of

Sphærophoron compressum. The exposed masses of the ridge are many of them curiously dotted with the green adnate fronds of *Lecidea geographica*. The reindeer lichen (*Cladonia rangiferina*), called by Crabbe

“The wiry moss that whitens all the hill,”

is plentiful on the turf with its allied species, and the sadder and darker *Cornicularia*, as well as the curious dangling rock-hair (*Alectoria jubata*); while in every part the brown and scarlet apothecia of the *Scyphophori*, in all their multifarious varieties, contribute to decorate the scene.

The calcareous rocks of the Silurian system at the base of the Herefordshire Beacon, especially on the side of Chance's Pitch, exhibit some local species not observable on the syenitic rocks, as *Endocarpon Hedwigii*, *Urceolaria calcarea*, *Lecidea rupestris*, *Collema sinuatum*, &c. The crab's-eye lichen (*Lecanora Parella*) is particularly fine and abundant throughout the chain from north to south, not only on the rocks, but on ash and other trees about the bases of the hills. I have been particularly attentive to the lichens, and have been as careful as possible to ensure correctness; though in such minute vegetation, often obscure even to a microscopic eye, it is very difficult to discriminate without some error. The *Opegraphæ* of the section *Graphis* are named on the authority of the Rev. W. A. Leighton. One lichen that I have met with appears to be undescribed, and I have thus characterised it:—*L. chryso-chlora* (golden-shielded *Lecanora*). Crust greenish, indeterminate, scattered, apothecia clustered sessile, very small, dull green, with a very thick, inflexed, gold-coloured or light ferruginous border. Scarcely visible to the naked eye but as a number of yellow specks on the exposed rocks; but under a lens very characteristic and peculiar.

The lichens form such a crust or time-tint of colour on the hoary rocks of Malvern, that it is impossible for the most superficial eye not to notice and admire them; and some, as the *Stereocaula*, appear like silver spangles scattered and clustered in the recesses of the rocks; though, when closely examined with a lens, these delicate, glaucous-green, granular lichens appear like minute, branching shrubs, beautiful as a mineral efflorescence. Even on the turf the *Scyphophori*, with their brown and bright scarlet apothecia, under the name of *cup-mosses*, are so variable in aspect as to be generally admired and collected, and are often alluded to by the poets of nature, as in the following lines by Mrs. Hemans:—

"Oh, green is the turf where my brothers play,
Through the long bright hours of the summer day;
They find the *red cup-moss* where they climb,
And they chase the bee o'er the scented thyme."

PROCEEDINGS OF SOCIETIES, &c.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, January 13, 1853.—Professor Balfour, President, in the chair.

The following donations were announced to the Society's library and herbarium:—From Dr. Royle,—his Papers on the Identification of the Mustard-tree of Scripture, and on the Hyssop of Scripture; from Professor Treviranus, of Bonn,—his work '*De Compositione Fructus in Cactearum atque Cucurbitacearum ordinibus*;' Account of the Cultivation of the *Victoria regia* in the garden of the Hon. Edward Chitty, Kingston, Jamaica, from Dr. M'Nab; British plants from Mr. Moore, of the Chelsea Botanic Garden, and Mr. Parker, Torquay. The Prospectus of Willkomm's work on the Flora of Spain, South-west of France, Corsica, and the Balearic Isles was laid on the table by Dr. Balfour.

Dr. Balfour noticed the following donations, recently made to the Museum of Economic Botany at the Botanic Garden:—From Henry Bains, Esq., Museum, York: Sections of a tree-fern twenty inches in circumference, and of *Urtica gigantea*, from New South Wales; woody substance (supposed to be the work of an insect) taken from the centre of a log of purple-wood of Guiana; fruit of the grapple-plant (*Uncaria procumbens*), from the Cape of Good Hope; Polyporous from the willow, with brooches made from it, exhibiting a shining, velvety appearance; opalized specimen of *Dacrydium Uredo*, from a tree of ten feet in circumference, said to be imbedded in basalt, in the Macquarie Plains, Van Dieman's Land; also the following microscopical preparations:—Bract of *Poinsettia pulcherrima*, showing the arrangement of the cells, containing red colouring matter; specimens of spiral fibres from spiral vessels, some of them composed of seven fibres, united so as to form a band, such as occurs in *Pleiotracheæ*; section of the silicified wood of *Dacrydium Uredo*, showing the disk-bearing woody tubes. From Miss Neill, Gayfield Square: Specimens

of an opalized endogenous stem, carboniferous fern (*Neuropteris*), and an old oak quagh, from Orkney. From A. H. Balfour, Esq., Hong Kong, China: Specimens of Chinese manuscripts; the letters are written on narrow leaves (probably of a palm), which are fastened together so as to form small books. From Daniel Oliver, jun., Esq., Newcastle: Four specimens of the interpetiolar glands and hairs of *Pentas carnea*, put up in a solution of chloride of calcium, on slides for the microscope. From Alexander Duff, Esq.: Large specimen of *Conferva ægogropila*, from a lake in South Uist, Outer Hebrides. From Mr. James Scrymgeour, Dundee: Specimens of vegetable substance found in the interior of a coffin in the old burying-ground, Dundee.

Mr. Stewart M'Glashen exhibited his patent apparatus for transplanting trees, shrubs, and herbaceous plants. The method of operating was fully explained; and a specimen of *Araucaria imbricata*, 2½ feet high, with a ball of earth 21 inches square, and weighing in all 3½ cwt., was shown in the state in which it had been taken up from the Botanic Garden; also a specimen of *Helleborus niger*, in flower, taken up with a ball of earth, by a smaller apparatus, consisting of two semicircular spades, placed together so as to form a sort of iron flower-pot, by the handles being pressed outwards.

Dr. Balfour made some remarks on the efficiency of the apparatus, and the ease with which it was applied. The *Araucaria* shown had been taken up in six minutes from the time the spades were first applied to the soil. He had seen various kinds of trees and shrubs taken up; and in every instance the method was most successful. In some cases four and five tons of earth had been taken up in the Botanical and Experimental Gardens. Dr. Balfour considered the invention as an admirable one, and as being well fitted for its purpose.

Dyeing Properties of Lichens.

The first part of a paper 'On the Dyeing Properties of the Lichens,' by Dr. Lauder Lindsay, was read.

Dr. Lindsay stated that his attention had been directed to the subject of the natural history of the lichens, two years ago, by Professor Balfour; that he had since been engaged in occasional researches into the structure and properties of these plants; and that the chief object of his present paper was merely to show, from the present state of our knowledge on this subject, the great amount of observation, in various departments of lichenology, which still remains to be made, and to ask the assistance and co-operation of members of the Society

in particular, and the scientific world in general, in following out several special paths of research, and clearing up some obscure points specially demanding elucidation, which are indicated below. He mentioned that, as his experiments and researches were only in progress, he could not at present furnish a *complete* paper on the dyeing properties of the lichens, or on any other individual department of lichenology, but intended to lay before the Society merely a number of isolated facts and notes, bearing generally on the present state of this branch of botany and botanical chemistry.

The author, after a few prefatory remarks, continued :—" It was not long till I found that the field was comparatively a new and open one, and that, unaided, I could proceed but a very short way in the examination of a subject of such vast extent, at first chiefly from want of instruments *with* which to operate, but latterly from deficiency of materials *on* which to operate. In the summer of 1851 (besides studying, so far as our metropolitan libraries would allow, the literature of the subject), I commenced (with the intention of working out leisurely) a series of experimental inquiries on the following points of the natural history of the lichens.

" 1. Their anatomy, organography, and physiology, and in particular :—

" *a.* Their *general* microscopical anatomy, with illustrative drawings and dissections. With the exception of the beautiful drawings contained in the ' *Abbildungen* ' of Link, in the ' *Cryptogamic Botany of Ross's Antarctic Voyage*, ' by Dr. Hooker, and in a few kindred works, we had then no complete series of drawings of minute structure, dissections illustrative of organography, nor any good monograph entering extensively, and, at the same time, accurately, into the special anatomy, &c., of these plants. But, since that period, the valuable memoirs of Tulasne, Bayrnoffer, and others have filled up a great gap in this branch of lichenology ; and I believe we may shortly expect, from the author of the ' *British Species of Angiocarpous Lichens*, ' a fuller work descriptive of the British lichens, which, I hope, will leave us little to do or wish for in this respect.

" *b.* The *special* anatomy of their *reproductive* organs, and the physiology of their reproductive function. On both of these subjects a war of discussion lately raged between the botanists of Germany and France ; and its fury is only now beginning to be subdued. Tulasne is the first, so far as I am aware, who has published anything like a complete series of drawings and descriptions of the lichen reproduc-

tive organs and their contents, since the discovery of the lichen-phytozoa (the spermatia, or spermogoni, of various recent authors).

"For the purpose of informing myself on their general and special anatomy, I began a detailed microscopic examination of all the British genera, subsequently extending my investigations to species; but this being a labour of immense extent, in a path as yet comparatively untrodden, and requiring therefore a great amount of time and application, I have been unable to work far in this direction.

"*c. Their chemical composition*, as ascertained by analysis. A few of the lichens best known to us, on account of their uses in medicine and the arts, have, at different times, been analyzed by Berzelius, Proust, John, Nees von Esenbeck, Schnedermann, Knop, Herberger, and other chemists; but their results have been very discrepant. It is therefore very desirable that the analyses made by these gentlemen should be carefully repeated at the present day, by men experienced in botany, as well as in chemistry; and it is further desirable that we should have an extensive and accurate series of analyses of all the British lichens (or, at least, of as many as can be obtained in quantity sufficient to subject to experiment) before we can come to any general and useful conclusion on the subject. I am not yet sufficiently acquainted with practical chemistry to undertake such analyses; but I have had, on different occasions, the ash of a few common species analysed qualitatively by more experienced friends. My efforts, however, in this direction have been greatly circumscribed by want of specimens. It can only be by the analysis of a large number of species that we can accumulate a mass of facts from which we may deduce general principles, and discover how far the chemical composition of different lichens is similar or varies; whether any, and what, relation subsists between their composition and external appearance, &c.

"*d. Their products and secretions*, including the chemistry of their nutritive and pigmentary principles, and its practical application. The subject of the colorific and colouring principles of the lichens has, within the last few years, attracted a due share of that attention which has been increasingly devoted to organic chemistry. Since 1830, Heeren, Kane, Schunck, Rochleder, Heldt, Knop, Stenhouse, Laurent, and Gerhardt have published valuable papers on these principles; but here, again, we have to regret the great discrepancy in the various results obtained; and there is therefore, here also, imperatively demanded re-investigation and correction before any of the results already published can be implicitly relied upon, and before we can have safe data

from which to generalize. I have no doubt that a great proportion of the obscurity overhanging this subject, depends on the circumstance that many of the chemists who have devoted attention to the colour-educts and products of the lichens were not themselves botanists, and have therefore probably, in some cases, at least, analyzed species under erroneous names, and also because their investigations have comprehended a much too limited number of species.

“2. Their *taxonomy*, or *classification*. This, however, is but a secondary, and comparatively unimportant, department, and can only be put upon a proper basis when the anatomy and physiology of the lichens have been fully investigated, and their laws firmly established.

“3. Their *geographical distribution*, a subject of no little interest in studying terrestrial nature on the large scale.

“4. Their utility.

“a. In medicine. On examining the literature of this branch of lichenology, I found that the lichens were, at one time in the history of medicine, regarded as a panacea, every kind and degree of therapeutic action having been, by ‘the profession,’ as well as the ‘profanum vulgus,’ attributed to them. Being very sceptical on the matter, I was naturally anxious to test these therapeutic actions, by experimenting, with the old officinal ? species and their active principles, on man and the lower animals ; but such experiments I have been obliged, for the present, to delay.

“b. In the arts, and especially in dyeing, including the collection of a series of the commercial dye-lichens, *i. e.*, those used by the manufacturers of London, &c., in the making of orchil, cudbear, litmus, and other lichen-dyes. While investigating the dyeing properties of the lichens, I made experiments, with a view to test their colorific power, on as many species as I could obtain in sufficient quantity to render it at all useful to operate on, that number, however, being very limited (between forty and fifty). But these experiments were speedily brought to a stand, on account of a paucity of material to work upon ; and one of my objects in placing the present remarks before the Society, is to request such members and their friends as have a superabundance of specimens of lichens, or are favourably situated for collecting them, and may be willing to sacrifice a few to such a purpose, to co-operate in furthering this branch of lichenology, by contributing a few of their spare duplicates. They need neither be rare nor fine specimens ; fragments, of every size and appearance, are equally acceptable ; indeed, I may emphatically say, in the usual words of the scrap-book title-page, ‘*Scraps* thankfully received.’

The same subject (of the dyeing properties of the lichens) also led me to the Great Exhibition of 1851, where I found several small, but highly-interesting, collections of dye-lichens and lichen-dyes, fabrics dyed by the latter, &c., exhibited by various metropolitan and provincial orchil and cudbear manufacturers and dyers, and by private parties. To a number of these exhibitors I subsequently wrote, requesting practical information, and specimens; and while a few did not apparently consider it within the sphere of their trade (in other words, remunerative) to supply samples for scientific purposes, others of them, in the handsomest manner, placed specimens gratuitously at my disposal; and I therefore willingly embrace the present opportunity of returning my most sincere thanks for such favours, to Messrs. Benjamin Smith & Son, orchil manufacturers, London; Messrs. James Robinson & Co., orchil and cudbear manufacturers, Huddersfield; James Howe & Co., silk-dyers, Coventry; the Portugese Consul, London; &c.

"I would here take the liberty of shortly pointing out how you may lend material assistance, in the present state of experimental inquiry, on the various subjects just enumerated.

"1. By contributing lichens in quantity, for the purpose of maceration, with a view to test their colorific powers. Those growing on rocks, in alpine situations, or on the sea-coast, in warm climates, of a pale or white colour, and of a pulverulent or crustaceous consistence, are to be preferred; but it is not essential, though also important, that the specimens possess fructification, or be otherwise in good condition.

"2. By contributing specimens, in *good* condition (and particularly with fructification), of native or foreign lichens, common or rare, with their names (botanical and vulgar), and notes of their habits, and any similar information, to illustrate structure, organography, geographical distribution, &c.

"3. By furnishing information on their economic uses, and on their special applications in dyeing and other arts (particularly on their employment as dye-agents, by the natives of Britain and other countries), with specimens of the lichens so used, and their common names, specimens of fabrics dyed therewith, notes of the processes employed for the elimination of the dyes, &c. Parties resident in or travelling through our western highlands and islands, the northern highlands, Ireland, Wales, Norway, Iceland, and similar countries, are most likely to be able to afford this description of information, many native

lichens being still used, by the peasantry of these countries, to dye their home-spun yarn, &c.; and, lastly,

“ 4. By contributing to the literature of lichenology, in the form of references to books or journals, &c., containing information of any kind on the natural history of the lichens; as well as to orchil and cudbear manufacturers, dyers, and other parties engaged in the importation or sale of orchella-weeds and other dye-lichens, or their conversion into dye-agents.”

Dr. Lindsay illustrated his paper with drawings of the minute anatomy of lichens, preparations of the dyes extracted from various native species, and specimens of the plants yielding these colours.

Flora of the District in the Neighbourhood of Peebles.

A paper by James Young, Esq., intituled ‘Remarks on the Flora of the District in the Neighbourhood of Peebles,’ was read.

The author gave a brief account of some botanical walks made in the autumn of 1851, and enumerated some of the plants which he had collected, and the localities in which they were found.

Mr. G. S. Blackie remarked that Mr. Young had not visited some of the best districts in Peebleshire; otherwise he would have found such plants as *Betula nana*, *Saxifraga aizoides*, *S. stellaris*, and *S. oppositifolia*, *Sibbaldia procumbens*, *Allosorus crispus*, &c., none of which appeared in Mr. Young’s list.

Cultivation of Victoria regia in Jamaica.

A paper ‘On the Cultivation of *Victoria regia* in Jamaica,’ by Dr. G. M’Nab, was read.

In this communication Dr. M’Nab stated that seeds had been sent to him by his brother, Mr. James M’Nab, of the Botanic Garden, Edinburgh, in September, 1851, that they had been planted by the Hon. Edward Chitty, at Kingston, in a tank prepared for the purpose, and that the plant had grown vigorously, and had flowered well. The full details in regard to the growth of the plant were given in a Jamaica paper, copies of which have been already noticed in this report, as presented to the Society.

Dr. Balfour observed that the structure of the stem of the *Victoria regia* had been examined recently by Mr. Henfrey, in the case of a specimen which flowered in the garden of the Royal Botanic Society, London. He says that the plant develops its stem by a terminal bud, like palms, throwing out leaf after leaf, in a spiral course; that there is no tap-root in the perfect plant, that produced in the embryo

decaying, and its place being supplied, as in Monocotyledons, by adventitious roots. There is no true bark, no pith, and no annular zones of vessels, the vascular bundles being scattered as in Endogena. Mr. Henfrey regards the stem of *Victoria* as endogenous, as Trecul had already done in regard to other Nymphæacæ, especially *Nuphar lutea*. The chief differences, Mr. Henfrey says, from Endogens are the absence of fibrous layers between the cortical and central tissues, and the composition of the vascular bundles being exclusively of spiral vessels, with unrollable fibres.

Edward Ravenscroft, Esq., Highland Society's Museum, was elected a Fellow.

Mr. Frederick Yorke Brocas, County Hospital, Winchester, was elected an Associate.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-second Sitting.—Saturday, February 26, 1853.—MR. NEWMAN, President, in the chair.

Nativity of the Box-tree.

The President read the following note, from Mr. C. C. Babington, dated St. John's College, Cambridge, January 28, 1853:—

"Mr. Watson, in his *Cybele* (ii. 366), appears very much inclined to consider the box-tree as not originally a native of England. The following extract from the beginning of Asser's '*Life of King Alfred*,' appears to show that it was plentiful in Berkshire 1000 years since. His words are:—'*Berrocscire; quæ paga taliter vocatur a "berroc" sylvæ, ubi buxus abundantissime nascitur.*'"

Chrysocoma Linosyris at Weston-super-Mare.

The President read the following note, from Mr. T. B. Flower, dated Seend, near Melksham, February, 1853:—

"Visiting Weston and its neighbourhood for a few days, during September last, I was fortunate enough to find a single plant of *Chrysocoma Linosyris*, on the hill near Knightstone. It required a good deal of searching for, being very diminutive, and not nearly so luxuriant as I have seen it growing at Berry Head. Having specimens, from the neighbourhood of Whorle Hill, in my herbarium, gathered by the late Mr. William Christie, I left the plant growing, in the hope of its gradually spreading. In the *Cybele* it is recorded

that Dr. Hooker searched for it, without success, in 1846 ; but in the following year, I am informed, it was observed by Mr. Tanner, near Anchor Head, and again in 1849, by the Rev. W. Crotch and Mr. Robert Wright, near Knightstone, possibly in the same locality as observed by myself. It is therefore more than probable that the plant may still be found in other parts of the neighbourhood, and should be searched for by some careful observer. I will just add that the *Eryngium campestre*, which I used to observe rather abundant at Weston, is becoming quite a scarce plant, and will, I am fearful, soon become lost, having only noticed one or two plants during my visit."

Plants found in North Wales.

The President read the following note, from Mr. W. Mathews, jun., dated Edgbaston House, Birmingham, February 14, 1853 :—

"During a short tour through North Wales, in August, last year, I gathered one or two plants a notice of which may be interesting to the readers of the 'Phytologist.' I am indebted to my friend Mr. Babington for the determination of the hawkweeds.

"*Hieracium strictum*, Fries. This plant occurs sparingly on Cader Idris, on the precipitous part of the mountain above Llyn Cae, to the south-east. (New to Wales).

"Another hawkweed, most probably *Hieracium crocatum*, Fries, occurs, in considerable abundance, on the left bank of the road from Llangollen to Corwen, about four miles from the former place.

"*Ulex Gallii*, Planch. Very common in North Wales. I noticed it in the counties of Denbigh, Merioneth, and Carnarvon.

"*Rubus incurvatus*, Bab. Common in Merionethshire.

"*Rubus suberectus*, Aud. Wood at Pystill y Cayne, near Dolgelly, Merionethshire.

"A bramble also grows at this latter place, which I believe to be *Rubus Sprengelii*, Weihe. I have noticed these last four plants, as I find, on reference to the third volume of Watson's *Cybele*, that information upon them is wanted from the counties mentioned above."

Effects of the late Mild Weather.

The President read the following note, from Mr. A. G. More, dated Trinity College, Cambridge, February 4, 1853 :—

"If the following plants, observed flowering in the Isle of Wight, be added to the list already published in the 'Phytologist,' they will, I think, indicate still more clearly the remarkable advance of the

present season, since they are all genuine spring flowers. In December we found a solitary flower of *Viola sylvatica*. Jan. 10, *Tussilago Farfara*, in flower. Jan. 21, *Mercurialis perennis*, and by the end of the month plenty in flower; *Caltha palustris*, several in flower, and many in bud, with quite an April luxuriance; *Narcissus Pseudo-narcissus*, twenty or thirty in flower. Jan. 31, *Cerastium tetrandrum*, in flower; *Alchemilla arvensis* (young plants), in flower; and on the same day (Jan. 31) we were no less pleased than surprised to find our little friend of last March, *Draba verna*, mostly with only a flower or two, scarcely raised above the leaves, but in a few cases even *in seed*, on its usual stem."

The following remarks, by Mr. I. W. N. Keys, dated Plymouth, January 25, 1853, and referring to the same subject, were read:—

"At this season of the year little can be said in the way of adorning a botanical ramble. I will therefore 'a plain unvarnished tale deliver,' and say that yesterday, being a fine day, I strolled, with another of Flora's votaries, to Weston Mills, which are situated about two miles from Plymouth, believing that, from the extreme mildness of the winter, *Helleborus viridis*, which grows in an old orchard at the first-named place, would be in flower. And such was the case: we gathered several examples. Besides this, in the same piece of ground, snowdrops (*Galanthus nivalis*), in large number, were drooping their graceful heads in beauty around us. What a charming flower is this! and how much is its loveliness enhanced by its early appearance, ere yet the winter has departed! The *Narcissus Pseudo-narcissus*, neighbour to the snowdrop, had not yet progressed beyond the bud condition; but it will very soon burst from its 'pent-house.' A solitary primrose (*Primula vulgaris*) gleamed here and there. The pilewort (*Ranunculus Ficaria*) was also unfolding its enamelled golden petals; and *Mercurialis perennis* was in bloom. All the foregoing were found within the precincts of the orchard. Dandelions, daisies, groundsel, and that little grass, *Poa annua*, were seen frequently during our walk, all in flower, of course; otherwise, they would not be named. The leaves of *Cotyledon Umbilicus* were extremely abundant, and very large; a circumstance attributable, I presume, to the very wet season which we have had. *Vinca minor* (lesser periwinkle) was trailing beautifully over a road-side hedge near Ham, and bedecking it with its delicate purple flowers. In this situation the plant appears perfectly wild. Here and there, in low and sheltered spots, a *Geranium Robertianum* had outlived the 'pelting of the pitiless storm,'

and bloomed on from autumn until now, as, also, had the *Pyrethrum Parthenium*. We also observed *Rumex obtusifolius* in flower."

The annexed notes on the mildness of the weather in the years 1747—1767, furnished by Mr. Luxford, were also read :—

"The following weather-notes will, I think, form appropriate *ad-denda* to the papers on the mildness of the present season by Dr. Bell-Salter and Mr. Lloyd in the last number of this journal (*Phytol.* iv. 845). They occur in the series of letters from Peter Collinson to Linnæus, printed in the Linnæan Correspondence,* and are interesting, inasmuch as they show that in the matter of mild winters and earthquakes there is really 'nothing new under the sun,' whatever may be said of railroads, steam-vessels, and the electric telegraph.

"English gardens, says the editor of the Correspondence, are indebted to Mr. Collinson 'for the introduction of many new and curious species, which he acquired by means of an extensive correspondence, particularly from North America.' His name is perpetuated in *Collinsonia Canadensis*, a North-American plant, imported in 1735, and so named by Linnæus in honour of his truly-amiable friend, who died at Mill Hill, near Hendon, Middlesex, on the 11th of August, 1768, in the seventy-fifth year of his age, and 'in the full possession of all his faculties, and of all his enthusiasm for the beauties of Nature, attended by far more important consolations and supports,' as is well expressed in his last letter to Linnæus, dated March 16, 1767.

"'London, Jan. 18, O. S. 1743-4.—We have now a wonderful fine season, that makes our spring flowers come forth. I am sure you would be delighted to see my windows filled with six pots of flowers, which the gardener has sent me to town; viz. great plenty of Aconites, white and green Hellebore, double Hepatica, Crocus, Polyanthus, Periwinkle, Laurustinus, vernal red Cyclamen, single Anemonies, and Snowdrops. This is my delight to see flowers, which make a room look cheerful and pleasant, as well as sweet. None of these were brought forward by any art, but entirely owing to the temperature of the season, though some years I have known things forwarder than now.'

"'London, Oct. 26, 1747.—My garden is in great beauty, for we have had no frosts; a long, dry, warm summer and autumn, grapes very ripe. The vineyards turn to good profit, much wine being made

* 'A Selection of the Correspondence of Linnæus and other Naturalists, from the Original Manuscripts. By Sir J. E. Smith, Pres. L.S., &c. 1821.'

this year in England. Sir Hans Sloane is hearty, Miller is well, and so adieu.'

"'London, Oct. 3, 1748, O. S.—We have had a fine Summer. Great plenty of all sorts of fruits and grain, and a very delightful Autumn. It is now as warm as Summer; no bearing of fires. My orange-trees are yet abroad. My vineyard grapes are very ripe. A considerable quantity of wine will be made this year in England.'

"'May 8, 1749.—On Thursday the 8th of February, at about half past 12 at noon, we had a smart shock of an earthquake, so violent that many ran out of their houses, thinking them falling down. How the Winter has been in Sweden I do not know, but at London the like warmth and mildness were never remembered. Our Autumn was long, warm, and dry, with a few slight frosts before Christmas; but we have had since fine warm dry weather, and no frosts or snow. Our gardens were in great beauty in January and February; almonds, apricots, and peaches in blossom.

"'Feb. 23d, I went into the country. The elm hedges had small leaves. Standard plums, almonds, and Cornus in full blossom. Gooseberries shewing their fruit. In short it would be endless to tell you the wonders of this season.

"'March 5, the fig in my London garden had small leaves, when peas and beans under South walls were in blossom.'

"'Ridgeway House, Dec. 25, 1757.—The extraordinary heat of our summer has ripened all sorts of fruits to perfection. In two gardens I saw this year pomegranates against south walls, without any art, ripened beyond what can be imagined in so northern a climate. They look extremely beautiful, and are of the size of some brought from abroad.

"'Our autumn has been long dry and warm, and so continues, for a few slight frosts have not stripped the garden of flowers at Christmas-day. We have four sorts of Aster and Virga aurea in flower, and plenty of Leucojums, double and single, Chrysanthemums, &c.

"'The winter scene is not closed before spring flowers begin; for there are plenty of Polyanthus-narcissus, Pansies, and sweet Violets, Primula veris, Polyanthus, Aconite, Hepatica, Anemonies both double and single, and Laurustinus. You would have been delighted and surprized to see the large nosegay that was all flowers gathered out of the open garden, without any art, Dec. 27, 1757.'

"'July 25, 1759.—We had the mildest winter ever known. Our spring was early and very agreeable, and our summer the finest and warmest since 1750. Great plenty of all sorts of grain and fruits. New wheat of this year's produce has been the 21st instant at market.'

“‘London, Sept. 2, 1762.—We have had a delightful warm summer ; all the fruits of the earth very good, and in great plenty ; and what crowns all, the blessing of peace is like to be added.’

“‘London, Sept. 15, 1763.—Almost every day rain since the middle of July, the spring and summer very dry to that time. Very great plenty of grass and all sorts of corn, but the weather unkindly for the harvest.’

“‘London, Sept. 17th, 1765.—You, my dear friend, surprize me, with telling me of your cool and wet summer ; whereas our summer has been as much in the extreme the other way. For all May, June, and July, were excessively hot and dry ; but six or seven rainy days in three months, so that all our grass fields look like the sun-burnt countries of Spain and Africa. Our Fahrenheit’s Thermometer frequently 84 and 85 in the shade in the open air, but in my parlour frequently at 95. I do assure you I have had little pleasure of my life this summer, for I cannot bear heat. I have longed to be on Lapland mountains. The beginning of August we had some fine rains, but they did not recover our usual verdure. Since, to this present writing, hot and dry weather, not a drop of rain for fourteen days past. Our hay is very short, and oats and barley but a middling crop ; but of wheat, which we most wanted, good Providence has favoured us with a plentiful crop, and a good harvest, which began two weeks sooner than in common years. Peaches, Nectarines, Figs, Grapes, Pears, &c. are early ripened, and are richly flavoured, and many exotic shrubs and plants flower finely this year. My garden is now a paradise of delight, with the variety of flowers and plenty of roses now in bloom, as if in May or June. But to obtain all this pleasure, great pains have been taken to keep the garden continually watered every evening.’

“‘London, Sept. 25th, 1766.—We have had a most uncommon rainy summer, which was no way propitious to the growth of the wheat ; but it pleased Good Providence to send us the finest hot and dry harvest ever known, yet the warm constant rains drew up the wheat so much to stalk, that the ears are very light. I hope there will be sufficient to support the nation, now we have prudently stopped the exportation ; for so great are the wants, and the demand for foreign markets was so great and so pressing, that it advanced the price so considerably as to occasion insurrections in many parts of the kingdom, to stop by force the corn from being exported ; but now a proclamation is come out to prevent it, I hope all will be quiet again. Much wet has made great crops of grass ; so that every where we have had second crops of hay almost as large as the first, and a glorious

autumn to make it. The fields have a most delightful verdure, and the gardens are in the highest beauty, being covered with great variety of autumn flowers, having not had the least frost to Oct. 4. I have housed none of my succulent exotics; for the weather is so hot, dry, and fine, they are better abroad than in the house. I survey my garden with raptures, to see the infinite variety with which the great Creator has enriched the vegetable world.'

"'Ridgeway-house, on Mill-hill, ten miles North of London, March 16, 1767.—I am here retired to a delightful little villa, to contemplate and admire, with my dear Linnæus, the unalterable laws of vegetation. How ravishing to see the swelling buds disclose the tender leaves! By the public news-papers we were told that with you in Sweden the Winter was very severe, the Sound being frozen over. I have no conception of the power of that cold which could fetter the rolling ocean in icy chains. The cold was what we call severe, but not so sharp as in the year 1740. It lasted about a month, to the 21st of January, and then the thaw began and continued. February the 1st and 2d were soft, warm, sunny days, as in April, and so continued, mild and warm, with southerly winds, all the month. This brought on the Spring flowers. Feb. 8th, the *Helleborus niger* made a fine show; the *Galanthus* and Winter Aconite by the 15th covered the garden with beauty, among some *Crocuses* and *Violets*, and *Primula veris*, &c. How delightful to see the order of Nature! oh, how obedient the vegetable tribes are to their great Lawgiver! He has given this race of flowers a constitution and fibres to resist the cold. They bloom in frost and snow, like the good men of Sweden. These flowers have some time made their exit; and now, March 7th, a tenderer tribe succeeds. Such, my dear friend, is the order of Nature. Now the garden is covered with more than 20 different species of *Crocuses*, produced from sowing seeds, and the *Iris Persica*, *Cyclamen vernale*, and *Polyanthos*. The 16th March, plenty of *Hyacinthus cæruleus* and *albus* in the open borders, with *Anemonies*; and now *my favourites* the great tribe of *Narcissuses*, shew all over the garden and fields; we have two species wild in the woods that now begin to flower. Next the *Tulipa præcox* is near flowering; and so Flora decks the garden with endless variety, ever charming.'

"The editor of the 'Correspondence,' Sir J. E. Smith, adds the following remarks, written by a friend to whom he had submitted the letters of Mr. Collinson:—

"'I have edified much on the subject of the Springs, which appear at that time to have been much milder than at present. We have now, for many years, had hard Winters occasionally, and an almost

constant succession of ungenial Springs. The seasons are, I conclude, subject to these variations. The series of mild Springs, which ended about the year 1785 or 1786, seems to have begun at least as early as 1749, and to have lasted 36 years. Our present series of cold Springs has yet lasted only 23 years. Of course we have 13 bad years to come before we can expect Violets and Narcissuses in January, and Grapes ripe in the beginning of September.’”

Plants found at Barmouth, Devon.

The President read the following, by the Rev. D. Broughton :—

“I send a list of some of the plants I gathered at Barmouth, last summer. There are several not mentioned in Watson’s ‘Botanist’s Guide.’ Anthyllis Vulneraria, Allium vineale, Matthiola sinuata (formerly abundant; I could find only three weak plants, not in flower), Campanula hederacea, Dianthus deltoides (abundant on the slope towards Aber Rhanffroch), Sedum reflexum, S. rupestre, S. Forsterianum, Anthemis arvensis, A. nobilis (Cwm Bychan), Lamium amplexicaule, Mercurialis annua, Trifolium fragiferum, Scilla verna (fide Rev. Wm. Jelf), Viola lutea, Hypericum Androsæmum, Erodium maritimum, Lavatera arborea, Suedia maritima, Serratula tinctoria, Sedum Telephium, Crithmum maritimum (sparingly* below Aber Rhanffroch), Spiranthès autumnalis, Gentiana Amarella, Vicia Orobus (in a hedge about a mile beyond Llanelyd, on the road to Trawfynnydd), Calystegia Soldanella (in the greatest abundance and beauty, especially at Mochras Island), Habenaria chlorantha, H. bifolia, H. viridis, Gymnadenia conopsea (this plant assumes such a different habit, when growing in a bog, from that which it has when growing on dry banks, as, for instance, the chalky south downs near Folkstone, as to suggest the doubt whether they are the same species), Lathyrus sylvestris, Pinguicula vulgaris (growing nearly down to the water’s edge), Trollius Europæus, Saxifraga tridactylites, S. stellaria, S. hypnoides, Carex dioica (*cum multis aliis quæ nunc, &c.*), Dipsacis tenuifolia (Harlech Castle), Euonymus Europæus, Mentha rotundifolia (near Hendre Coed), Isoetes lacustris, Silene Anglica, Veronica hybrida (in tolerable abundance on the little rocky knoll just out of Barmouth, on the Harlech road), Narthecium ossifragum, Antirrhinum Orontium, Cakile maritima, Echium vulgare, Geranium sanguineum, Antennaria margaritacea (in one suspicious locality just below the turnpike on the Harlech road), Polypodium Phegopteris, Aspidium Oreopteris, Osmunda regalis, and Botrychium Lunaria.”

Sketch of the Island and Flora of Hongkong, China.

By Dr. H. F. HANCE.*

HONGKONG, a corruption of Hiangkiang, "the Fragrant Streams," is the name of one of a number of islands in the China Sea, at a short distance from the mouth of the "River of Pearls," on the left bank of which stands the city of Canton, and from which it is divided by a narrow strait, called Kap-shui-mún† (*vulgo* Cap-sing-moon), or "Swift-water Passage," running between the mainland and a continuous chain of small islands, of similar character and aspect to itself. It is situated between lat. $22^{\circ} 9'$ and $22^{\circ} 21'$ North, and long. $114^{\circ} 6'$ and $114^{\circ} 18'$ East, and is distant from Canton about eighty-five miles, and forty from the Portuguese settlement of Macao, on the peninsula of Hiangshan. At the narrowest part of the Lai-i-mún passage to the eastward, it is only about half a nautical mile from the mainland. It resembles, in general form, a scalene triangle, of which the apex is towards the West, but is of very irregular and sinuous outline, especially on the southern coast, which forms the longest side of the triangle, having an area of 29.14 square miles; while it is not quite twenty-seven miles in circumference.

It consists of a long and precipitous mountain-ridge, running east and west, in some places gradually sloping down towards the sea, where it is met by extensive level beaches of fine, clear, white quartz-sand; in others, terminating abruptly in frowning perpendicular cliffs, more than 100 feet in height, perforated at their base by caverns, into which the waves dash with a hollow sound, throwing up clouds of spray. From this ridge, spurs diverge at different angles. The peaks vary in altitude, the loftiest being about 1860 feet above the sea-level. The prevailing rock is syenite (extensively quarried, and used for edifices), which is found in immense blocks, imbedded in a soil composed of the same rock, in various stages of disintegration and decomposition (laterite), or piled up in fantastic shapes on the hill-summits. The constituents of this rock also occur more or less separate;—felspar in its normal condition, or changed into a pure white or pinkish clay; hornblende cropping out on the surface, in

* Read before the Linnean Society, and communicated by Berthold Seemann, Esq., F.L.S.

† By a very natural error, I find, in nearly all systematic works, plants gathered about this locality noticed thus:—"Hab. in cap. syng-moon," or "crescit ad prom. sing-moon;" the first word being understood as an abbreviation of *caput*.

deep black lustrous crystals ; and quartz traversing the laterite, in dykes of variable thickness. Masses of trap are also met with, translucent crystals of carbonate of lime not unfrequently found in the centre of the blocks of syenite, and the beds of ravines afford fragments of laminated mica. No signs of stratification, or of volcanic action, are discoverable. At the base of the primary ridge, in those places where it terminates at some distance from water-mark, and between the various spurs, patches of alluvial soil are found, consisting exclusively of decomposed vegetable matter washed down by the rains, and mingled with the laterite. These are sedulously turned to account by the natives, for agricultural purposes, and, owing to care in manuring and irrigation, are sufficiently productive. The numerous ravines by which the flanks of the hills are cleft, furnish a never-failing supply of water, remarkable for its extreme purity ; and a little below one of the loftiest peaks arises a considerable spring, the singular position of which leads to the belief that it may have a submarine communication with the mainland. During the summer season, these streams become greatly swollen ; and the spectator sees the angles of junction of the spurs and main range distinctly traced out by lines of foam, indicating the course of these turbulent cascades.

The climate is subject to a variation of temperature, from 47° to 93° Fah. The daily range rarely exceeds fifteen degrees. Once only, during the years 1844—1851, did the thermometer sink as low as freezing point. Towards the end of October or the commencement of November, the north-east monsoon sets in. The atmosphere is wonderfully serene ; the air cold, bracing, and dry ; and the transition from an atmosphere saturated with moisture, is marked by the warping and splitting of tables and other wooden articles of furniture, accompanied by considerable noise, and the curling up of papers, as occurs in this climate when they are placed in a heated room. This is the winter, which endures until about the middle of February, during which scarcely any rain falls, and vegetation is dried up and scanty, a few *Compositæ* being nearly all that can be found flowering. Gradually the temperature becomes higher, the atmospheric deposits greater, the dry, discoloured leaves of the myrtle, *Melastoma*, and *Emblica* fall, their branches kindle with a tender vernal green, and innumerable flowers spring up from the turf, until, about May, summer is heralded by the advent of the south-west monsoon. This season is characterized by a most intense and oppressive heat, which causes the greatest languor to European residents ; rain falls for a week or ten days together, rather in sheets than drops ; the swollen torrents rush

roaring down into the sea, which they often discolour for a quarter of a mile from the shore ; terrific thunderstorms reverberate amongst the hills, which are hidden in a dense veil of cloud and mist ; and such is the excessive humidity of the atmosphere, that articles of wood or Russia leather, or the covers of books, even if washed over with alcohol or a solution of some essential oil, become, in the course of a night, covered with a thick, blue mould. The rain will then cease for a few days ; the heavens remain unclouded, though always more or less hazy, and lit up in the evenings by almost unintermitting flashes of sheet lightning ; not a breath will agitate the air, tremulous with the heat radiated from the ground ; and the silence is alone broken by the unceasing, loud, and monotonous chirping of the *Cicadæ* hidden in the grass. At this period, vegetation is at its height, and is developed with wonderful rapidity : a few days suffice to perfect the blossoming of the richest flowers, which, again, fade as quickly ; so that to an occasional explorer the face of Nature is singularly protean, and impresses him with a high idea of its luxuriance. About the beginning of September, the rain becomes much less frequent, though the heat is still excessive, and, as a natural consequence, the Flora assumes a more sober and less attractive habit. This period may be considered equivalent to our autumn. It is now that the island is occasionally visited by typhoons, those terrible circular storms which traverse the Indian Ocean and China Sea, and, when they meet with the land in their course, unroof houses, tear off and carry away doors and Venetians, drive vessels from their anchorages, prostrate trees, blight and destroy nearly all vegetation, and cause wreck and devastation wherever they pass. Finally, the temperature decreases, the rains cease, and the vegetable world remains dormant, seeking repose after its late activity, and recruiting strength for that of the succeeding year : winter has again returned, and the cycle of the seasons is completed.

To a stranger landing, or regarding the island from the sea, the aspect of Hongkong is very unpromising, conveying the idea of almost absolute sterility. The hills are covered by a mantle of coarse grass, amidst which rise masses of bare, blackened rock ; while the monotonous scene seems varied only by a few bushes or a solitary tree studded here and there, and by scattered groves of the *Pinus sinensis* clothing some of the declivities. As remarked by Meyen, there is no doubt that this tree was at one time far more common, and originally formed dense woods on the flanks of the hills of all the islands hereabouts ; but it is used very extensively by the Chinese

for burning; and, plantations being seldom or never formed, it thus decreases rapidly. On a closer inspection, however, the botanist is gratified by finding that the first impression is very deceptive; and, indeed, it is probable, that whether as regards the number of species, or the variety of new and interesting forms comprised in its Flora, the island is, for its size and geographical position, entitled to a very high rank.

The *littoral** Flora consists of *Vitex trifolia*, the fruit of which resembles allspice in taste, *Clerodendron inerme*, *Scævola taccada*, *Chenopodiæ?* sp., *Ipomœa pes-capræ*, trailing to an immense distance along the sands, and rooting at intervals, *Dilivaria ilicifolia*, two or three species of *Euphorbia*, *Guilandina bonduccella*, forming, in some places, impenetrable thickets, *Wollastonia scabriuscula*, *Platycodon grandiflorum*, always amongst rocks close by the sea, *Crotalaria calycina* and *C. albida*, *Ægiceras majus*, *Ardisia crispa*, *Paritium tiliaceum*, which affords a magnificent spectacle when covered with its fine sulphur-coloured flowers, which are much infested by a

* It may not be uninteresting to compare with this list the littoral Flora of other islands at no great distance. That of Malacca, according to the late Mr. Griffith, consists of *Calophyllum*, *Sideroxylon*, *Scævola*, *Pterocarpus?*, *Terminalia catappa*, *Verbesina*, *Premna*, *Ficus*, *Vaccinium*, *Sapindeæ*, *Hoya*, *Cassyta*, *Grammatophyllum*, *Loranthus retusus*, *Vitex*, *Xylocarpus*, *Crotalaria longipes*, *Calamus*, *Myrica*, *Eugenia*, *Epithinia*, *Plectranthus*, a *Pomacea*, *Maba*, *Gmelina*, *Avicennia*, *Rhizophora*, *Hydrophytum*, *Pogonatherum*, *Filices*, *Algæ*, &c. That of Prata Island (Prata, in Portuguese, *silver*; several vessels freighted with treasure having been lost there), a low coral islet, situated in N. lat. 20° 42' 55", and E. long. 116° 44' 45", and bearing S.E. by E. 175 miles from Hongkong, according to a collection that was brought to me of all that is found thereon, comprises *Ipomœa pes-capræ*, *Tournefortia argentea*, *Euphorbia*, *Morus alba*, no doubt of accidental occurrence, *Cassyta*, *Morinda bracteata*, *Scævola taccada*, a very beautiful and distinct species of *Portulaca*, with yellow flowers (*P. psammotropha*, *mihi*, in Walp. Ann. Bot. Syst. ii. ined.), and an apparently new genus, closely allied to *Pyxipoma* (*Psamathe marina*, *mihi*, l. c.). The "Noord Wachter" (a very small, uninhabited island, probably in no part twenty feet above the level of the sea, and with a soil composed exclusively of broken-up white coral, and a slight admixture of decayed vegetable matter, situated between Java and Sumatra, in lat. 5° 12' 30" S., and long. 106° 32' E., and bearing from Batavia N. by W. $\frac{1}{4}$ W. 60 miles, which the writer had an opportunity of visiting, owing to the vessel in which he returned from China striking on a reef, and remaining fixed there), is thickly clothed with lofty arborescent figs, *Rhizophora*, *Pemphis acidula*, a large-leaved, tall *Euphorbiaceæ*, *Morinda*, a lilac-flowered leguminous plant (apparently a *Canavalia*), a *Cinchonaceæ*, *Scævola taccada*, *Piper betel*, *Calamus*, and some others, which he was, from want of books, and on account of the circumstances of his stay, unable to determine. There were no palms; but all the plants observed were unquestionably wild.

large black ant, *Abrus precatorius*, *Cassia pumila*, *Glossogyne pinnatifida*, *Pandanus fœtidus* (much used as a hedge by the natives, who also eat the tender shoots, by which means, and by constant clipping, it remains stemless, though, when left to itself, it assumes an arborescent form), the lovely and fragrant *Crinum asiaticum*, *Tetranthera Roxburghii*, a fine, tall tree, *Spinifex squarrosus*, a *Rottbœllia*, and *Heteropogon contortus*.

Amongst those plants which occupy a subordinate position in the Flora, but are still more or less common or characteristic, must be enumerated a pretty little *Curculigo*, with leaves like a *Luzula*, which expands its star-like, golden-coloured blossoms close to the earth on the advent of spring, *Rourea microphylla*, *Ternstrœmia japonica*, *Ficus pyriformis*, *F. stipulata*, and *F. hirta*, *Crotalaria elliptica*, with its hispid, orbicular legumes, the fine crimson-flowered *Ixora blanda*, an undescribed *Begonia*, *Raphiolepis rubra*, which replaces our hawthorn, *Æginetia indica*, *Bambusæ*, the elegant *Blackwellia Loureirii*, *Massœnda pubescens*, conspicuous for its large, irregular, snow-white calyx-segment, *Paliurus Aubletii*, *Berchemia lineata*, *Strychnos colubrina*, the seeds of which are employed by the Chinese, under the name of *Mâ tau*, or horse-beans, for the destruction of rats, &c., *Choripetalum obovatum*, *Striga hirsuta*, the tallow-tree (*Stillingia sebifera*), *Jasminum paniculatum*, fragrant and free-flowering, the purple-bloomed *Pterostigma grandiflorum*, *Pothos scandens*, *Paratropia cantoniensis*, a handsome, shady tree, *Syllisium buxifolium*, a very neat shrub, *Embelia ribes*, *Osbeckia chinensis*, *Ardisia primulifolia*, adorned with glossy, crimson, holly-like berries, *Rostellularia procumbens*, &c. *Cardiospermum halicacabum*, with its bladdery fruit, scrambles amongst the herbage, amidst which rise the pretty lilac spikes of *Ophiopogon spicatus*. Several *Gardenias*, *Ilices*, *Pittosporum glabratum*, and *Eyrea vernalis* please the eye by the neatness of their foliage, round which *Cuscuta monogyna*, *Toxocarpus Wightianus*, and several *Bauhinias* twine their slender stems. To these must be added a velvet-leaved, arborescent *Sponia*, the delicate *Salomonina cantoniensis*, *Oxalis corniculata*, *Rubus parvifolius*, *R. leucanthus*, *nob.*, and *R. reflexus*, the latter remarkable for the extreme beauty of its foliage, two handsome *Cæsalpinixæ*, *Zornia diphylla*, which enamels the turf with its minute yellow blooms, resembling those of our *Lathyrus pratensis*, *Asparagus falcatus* (to which must be referred, as a synonyme, the *Melanthium cochinchinense* of Loureiro, placed by Kunth among altogether doubtful plants), several species of *Hedera*

and *Cissus*, and, amongst ferns, *Osmunda Vachellii* and *Blechnum orientale*.

Streamlets and their banks, moist rocks and inundated localities are rendered gay by the delicate *Drosera Loureirii*, *Xyris indica*, an elegant Primulaceous plant, white, yellow, and blue-flowered *Utriculariæ*, the tall *Philydrum lanuginosum*, *Ludwigia*, *Jussiaëæ*, with their white or yellow blossoms, *Hypericum monogynum*, *Eriocaulon cantoniense*, and another very minute species, raising their clustered, white, globular heads above the clear water, amidst the lively green fronds of *Ceratopteris thalictroides*; whilst way-sides and arid places furnish the ephemeral *Cyanotis axillaris*, and several *Commelynæ*, *Polygoni*, *Alternanthera axillaris*, thorny *Sclerostyles*, *Achyranthes aspera*, *Emilia sonchifolia*, two or three *Sidææ*, our garden *Chrysanthemum* (*Pyrethrum indicum*, D.C.), with single yellow flowers, *Corchorus acutangulus*, bearing a fruit with divergent horns, *Triumfetta angulata* and *T. cana*, and *Urena sinuata*, all three employed by the Chinese, as demulcents and emollients in blennorrhœa and other diseases, on account of the great quantity of mucilage they afford. *Erianthus japonicus*, growing in thick tufts, attains a height of six or eight feet, and elevates its beautiful, light, feathery panicles amongst the rocks. The dark blue berries of *Dianella ensifolia* hang pendulous above its sword-like leaves, along with the cedar-scented *Caryopteris mastachanthus*, and the graceful lilac bells of *Gutzlaffia aprica*.

Amongst ruderal plants, by which I understand all those that, though not cultivated, are yet only found in the immediate vicinity of dwellings, or in places formerly occupied by them, and which appear, in many instances, to follow the footsteps of man spontaneously, I include the following:—*Solanum nigrum*, and another thorny species, with purple flowers and yellow fruit, the size of that of the potato, *Amaranthus spinosus*, *Xanthium discolor*, *Asclepias curassavica*, *Plantago major*, *Psidium*, *Stellaria media* and *S. uliginosa*, *Ranunculus sceleratus*, *Datura alba* (the seeds of which are burnt by burglars, when attempting to enter a dwelling, in order, by their fumes, to stupify the inmates, a device which is, unfortunately, often crowned with success), *Polanisia icosandra*, *Cardamine hirsuta*, *Nicotiana tabacum*, *Bidens chinensis*, *Corchorus capsularis*, *Bryophyllum calycinum*, the singular *Euphorbia tirucalli*, with its leafless, green, quill-like branches, abounding in a violently acrid milky juice, said to be employed, by the Chinese, for blinding those children whom they wish to bring up as mendicants, in order thereby to excite compassion, *Siegesbeckia orientalis*, *Cassia occidentalis*, *Sonchus olera-*

ceus, *Ricinus communis*, of which the two varieties, one with red and the other with pale veins to the leaves, appear never to be found intermixed, *Verben officinalis*, *Capsella Bursa-pastoris*, a *Galium* closely allied to *G. aparine*, *Rumicis* sp., *Plumbago zeylanica*, *Lochnera vincoïdes*, *Physalis pubescens*, *Bothriospermum tenellum*, *Pedaliium murex*, *Dysosmia fœtida*, *Mucuna macrobotrys*, *nob.*, and *Cerbera odollam*.

The *sylvan* Flora consists of seven or eight species of oak, amongst which is a most beautiful one (*Quercus Eyrei*, *miki*), belonging to the section *Chlamydobalanus* of Endlicher, and nearly allied to *Q. cuspidata*, *Sieb. & Zucc.*, which, however, it excels in all respects, *Liquidambar*, *Synædrys ossea*, the fruit of which, resembling the chestnut in taste, is sold in the markets, an elegant *Styrax*, *Acer*, *Camellia japonica*, and two others, *Vaccinium*, *Cyminosma resinosa*, five or six species of *Euonymus*, *Aquilaria chinensis*, *miki*, *Memecylon*, an extremely handsome *Castanea*, *Rhodoleia formosa*, *Calauma pumila*, *Artabotrys*, the graceful *Melaleuca*-like *Phoberos sævus*, *miki*, and *P. chinensis*, *Piper arcuatum*, two species of *Elæocarpus*, *Rhapis flabelliformis*, *Hiptage madablota*, the sweet-scented *Schoepfia sinensis*, &c. At the foot of the hills, on the slopes of which these woods occur, are ravines, whereof the sides are in some places formed by steep rocks, the humid, shady ledges of which are clothed by the lovely *Chirita sinensis*, an exquisite *Cypripedium*, *Renanthera coccinea*, *Pholidota imbricata*, and a few others. Higher up, and in sheltered localities, these woods become in some parts much denser, and assume a far more tropical aspect, as is indicated by the great abundance of *Lycopodia*, and the appearance of *Cibotium glaucum*, *Neottopteris nidus*, and *Psilotum triquetrum*; whilst the trunks of the trees are clothed by a climbing, large, glossy-headed *Anthurium*, and the epiphytal *Niphobolus pertusus*.

At or near the summits of the different peaks, where, from altitude and the free exposure to both monsoons, the temperature is much lower than on the flanks of the hills, a difference of as much as 10° existing in the summer season, the Flora has a more European character. It comprises the pretty, but scentless, *Viola tenuis*, *Lonicera*, *Clematis*, *Polygala Loureirii*, *Polyspora axillaris*, the lovely *Enkyanthus reticulatus*, the "new-year flower" of the Chinese, *Phaius grandiflorus*, *Rhododendron squamatum* and *R. indicum* (the latter so profuse a flowerer, that it looks, at a distance, when brought into relief by the dusky sides of the rocks, or the dry grass, like a bush of fire), the azure *Exacum bellum*, replacing our gentians, *Torenia asiatica*,

Chloranthus inconspicuus, *Cirsium chinense*, *Lilium longiflorum* (affording a magnificent spectacle, with its large, cernuous, white flowers, and the bulbs of which, when stewed, are much esteemed by the natives), a particularly elegant little Composite (*Gerbera amabilis*, *mihi*, in Walp. Ann. Bot. Syst. ii. ined.), and *Ligularia Kämpferi*, confined to the damp ledges of rocks; whilst the deep green, luxuriant carpet of verdure is enamelled by the most beautiful Orchids, such as the golden *Spathoglottis Fortuni*, *Arundina sinensis*, the modest *Spiranthes australis*, *Platanthera Susannæ*, with its lacinated, snowy perianth, *Glossaspis tentaculata*, &c., and the heath-like *Bæckia frutescens*, which, when rubbed between the hands, exhales a most pleasant aromatic odour, springs up in moist places, with a glaucous *Carex*, *Scleria*, and *Lepidosperma*.

The *normal*, or characteristic, species, those which are most widely distributed, most numerous, and which most clearly strike the observer, as constituting the peculiar and distinguishing character of the Flora, are, amidst a thick, but rather coarse, turf, consisting of species of *Cyperus*, especially in damp localities, *Paspalus*, *Chrysopogon*, *Andropogon*, *Anatherum*, *Digitaria*, *Lycopodium cernuum*, &c., *Myrtus tomentosa* (with its gay, rose-coloured flowers, and sober, green leaves, clothed beneath with a close, white down, which is met with everywhere, and may be considered the commonest plant in the island, and the fruit of which, when ripe, has a resinous, not unpleasant taste, somewhat resembling that of the black currant, and is eaten by the natives), *Melastoma calycina* and *M. macrocarpon*, covered with magnificent purplish pink blossoms, *Ancistrolobus ligustrinus* (a pretty, compact shrub, with dark, blood-coloured flowers, smelling like our St. John's-wort), and *Callicarpa tomentosa*, and another with branches hidden in a velvety, fulvous down, lovely, bright green leaves, farinose beneath, and dense bunches of small, reddish lilac flowers. An *Emblica*, very common on the low grounds, is among the first to put forth its delicate, green leaves on the approach of spring, two *Clerodendra*, the neat, myrtle-like *Rospidios vaccinoïdes*, *Strophanthus divergens* (with its trailing branches, dark, glossy foliage, and curious, reddish yellow, caudate corollas), two pretty *Uvariæ*, *Helicteres angustifolia*, *Desmodium triquetrum*, *Dicerma elegans* (to which I refer, without doubt, the *Æschynomene heterophylla* of Loureiro, hitherto undetermined), and *Melanthesa chinensis* are almost equally common. *Alpinia nutans* elevates its gorgeous racemes of flowers, of a light flesh-colour, streaked with the intensest gold and scarlet, by the water-courses; *Ameletia subspicata*

in some parts clothes the flat, moist, meadow-like turf with so thick a verdure, that, when in blossom, it looks, at a distance, like a field of thyme; the silvery foliage of the graceful *Rhus succedaneum* flutters in the breeze, *Smilax glabra* straggles over the rocks, *Lygodium japonicum* and the leafless, parasitical, intertangled *Cassyta filiformis** climb over all shrubs indiscriminately, the latter perfidiously abstracting the sap, with its cup-like suckers, from those plants from which it claims support; and the abundant, pectinated *Gleichenia dichotoma*, with *Pteris nemoralis*, *Adiantum amœnum*, *Nephrolepis tuberosa*, and other ferns, spring up among the herbage.

Finally, to descend to the lower classes of the vegetable world, the few mosses which are found consist of species of *Hypnum*, *Neckera*, *Fissidens*, *Trematodon*, and *Physcomitrium*; the exposed masses of syenite are occasionally clothed with a foliaceous lichen, apparently a species of *Parmelia*; a handsome crimson *Phallus*, covered with a fœtid gelatinous matter, and various agariciform Fungi, spring up meteorically amidst the grass, in the hot and damp summer months; whilst *Polyporus sanguineus* and a few others are met with on the bark of trees; and the common mushroom has of late appeared spontaneously, in immense quantities, in a flat, meadow-like valley to the east of the town used as a race-ground, and for the training and exercising of horses. The rocks and sands along the coast afford a few *Sargassa*, and a *Corallina*, which seem to constitute all, or nearly all, the Algæ.

The most noticeable feature in the Flora of this island, is the mixture of Asiatic and European forms, especially conspicuous in the vernal vegetation of the hill-summits. In this respect, it appears to approach closely to that of Cashmere. Its connexion with that of

* Though perhaps rather irrelevant to the occasion, I here embrace the opportunity of correcting an oversight which Prof. Ernst Meyer has committed in a note (p. 120) to his edition of the treatise 'De Plantis,' by Nicolas, of Damascus (Lips. 1841), where, in attempting to identify the *Συριακὸν βοτάνιον, κισσύτα, or καδίτα* of Theophrastus, which he presumes, after rejecting the claims of *Cuscuta monogyna*, to be the *Usnea florida*! he remarks that he is acquainted with no other twining parasitic plants inhabiting the East. But there is no doubt that the plant referred to, and which is also noticed by Pliny, is the present one, described by Forskal, under the name of *Volutella aphylla* (Cfr. Sprengel, Hist. Rei Herb. i. 90). Fraas also ('Synopsis Floræ Classicæ') erroneously refers the *καδίτα*, though with a mark of doubt, to *Cuscuta epilinum*. Situation exercises a great influence on *Cassyta*, for I possess a specimen, gathered close by the sea-shore on Prata Island, south coast of China, which is much fleshier and stouter in its proportions, and has altogether the appearance of a different species, though I believe in no wise distinct,

Australia is very slight, being merely indicated by such genera as *Stylidium* and *Philydrum*, the last of which is exclusively confined to Cochin-china, the south of China, and parts of New Holland. Tropical plants, identical with, or intimately allied to, those of the Indian Peninsula and the Malayan Archipelago, are not unfrequent; and *Anthurium*, *Chirita*, *Æschynanthus*, *Sponia*, *Piper arcuatum*, &c., &c., may serve as examples; but they by no means represent the normal character of the Flora, which is perfectly *sui generis*. The only three indigenous palms are a dwarf, stemless species (perhaps a *Seaforthia*), *Zalacca*, and *Rhapis*. *Cocos* is occasionally planted, but does not thrive, the island of Hainan being its most easterly station in these seas; and even there it is said to perfect fruit sparingly. Its most obvious relationship is, however, with Japan, as evinced by the presence of the new oak above alluded to, half a dozen genera of *Ternströmiaceæ*, and some *Hamamelidaceous* forms (adopting the late Dr. Gardner's views of affinity), as *Eustigma*, *Liquidambar*, and *Rhodoleia*, both families being peculiarly characteristic of the Flora of those islands. How far a resemblance may hereafter be traced between the vegetation of Japan, the south and south-east of China, and some districts of upper India, it is at present impossible to predict; but I may here refer to the distribution of *Abelia* and *Adamia*, and observe that a new *Helwingia* has been detected at Darjeeling, and two species of *Corylopsis* in the Bootan mountains.

Amongst *cultivated* plants, the sweet potato (*Batatas edulis*) holds the first rank. It is very largely consumed by the Chinese, even its boiled leaves being used as greens. We must also notice, as vegetables, yams (*Dioscorea* sp.) and *Colocasia*, several species of *Sinapis* and *Brassica*, *Basella rubra*, employed as a substitute for spinach, various species of *Dolichos*, *Soja*, and *Phaseolus*, egg-apples (*Solanum Melongena*), our common potato and pea, water-melons and other *Cucurbitaceæ*, ground-nuts (*Arachis hypogæa*), a little barley, grown exclusively for pearling, Cassava (*Manihot utilissima*), *Allium fistulosum*, rice, millet, *Setaria*, sugar-cane, maize, *Abelmoschus longifolius*, the immature viscid capsules of which are brought to table; and, as fruit, *Pomeloes*, *Citrus Decumana*, oranges, Loquats (*Eriobotrya japonica*), Papaws (*Carica Papaya*), Wangpis (*Cookia punctata*), *Nephelium Litchi* and *N. Longan*, Mangoes, Bananas, pine-apples, *Averrhoa Carambola*, Guavas, and *Jambosa malaccensis*. The farinaceous fruits of *Trapa bicornis*, those of *Canarium album*, preserved with salt, and much resembling an olive in flavour, the crimson, papillose, acid drupe of a species of *Elæagnus*, pears, plums, and peaches, of exceedingly bad

quality, and the amygdaloid nuts and fleshy root of *Nelumbium speciosum* are brought to market, and are all grown in its vicinity, though not in the island itself. *Gossypium herbaceum*, *Bœhmeria nivea*, *Piper betel*, and a species of *Indigofera* are cultivated for economic purposes, other than esculent. *Ficus nitida*, whose claims as a true native I consider very doubtful, is planted around the villages; and the fields and garden-patches are surrounded by hedges of *Pandanus fœtidus*, *Euphorbia nereifolia*, or *Curcas purgans*.

H. F. HANCE.

[This article, together with a considerable collection of Chinese plants, was given to me by my friend Dr. Hance, to be freely employed in the Botany of H.M.S. 'Herald;' but, as Dr. Hance has some time ago returned to Hongkong, and will probably be able to send some additional notes, before the portion of my work relating to China is published, I have thought it advisable to insert the present article in the 'Phytologist,' a journal in which Dr. Hance has always taken a lively interest.—*B. Seemann.*]

PROCEEDINGS OF SOCIETIES, &c.

DUBLIN NATURAL-HISTORY SOCIETY.

Friday, February 11, 1853.—George A. Pollock, Esq., in the chair.

The minutes of the previous meeting having been read and confirmed,

Mr. Andrews, one of the Secretaries, said that it was with feelings of the utmost pride and pleasure that he again witnessed the assembling of the members in their old quarters,—rooms in which the Society had flourished and prospered; and he trusted that the times of difficulty had passed, and that the future progress of the Society would be more flourishing and prominent than ever. It was not the intention to give any address upon the occasion, until the rooms were prepared to receive their friends, and the museum carefully arranged. It was in that room, nearly twelve years since, that he (Mr. Andrews) gave his first paper; and he was happy to see that there were young

members, of promise and energy, to enter into the pursuits for which the Society was established.

Undescribed Variety of Blechnum Spicant.

Mr. Kinahan read a paper 'On an Undescribed Variety of Blechnum Spicant.'

The author said:—"It is my intention, this evening, to place on our annals a notice of some varieties, or rather monstrosities, of ferns, most of them unnoticed hitherto in this country, and one, at least, hitherto undescribed. Many authors inveigh against the study of these monstrosities, saying it arises from a depraved and puerile taste; yet the student of morphology must deem them interesting, since it is by the exception the rule is best shown. Again, they may often be of use in distinguishing between two allied species, as we find oftentimes a monstrosity in one species not found in a closely-resembling one. There are, also, strange analogies pervading certain classes, and that irrespective of natural family or outward conformation, the same form of monstrosity sometimes occurring in widely-removed genera. Into these points I will not at present enter more fully, as I hope to return to the subject before the end of your session. I shall now content myself by laying the growing specimens before you, and briefly pointing out their analogies, merely adding that these irregularities of form do not arise, as some suppose, solely from cultivation, as the same form may be found under conditions diametrically opposite, as regards abundance or absence of moisture, a shade, richness or barrenness of soil, &c. The first I shall notice is the striking variety of *Blechnum Spicant*, *Roth*. It was found in July, near Upper Lough Breagh, county Wicklow, and has not been hitherto noticed by any author. The nearest approach to it is a frond figured by Dr. Deakin, in his 'Florigraphia Britannica,' which is identical with the variety of the same plant of which I now show you specimens, gathered in the counties of Carlow, Clare, and Waterford. To this form, the name of *multifidum* may with propriety be given; while, for that first mentioned, *ramosum* would be appropriate. The two differ materially: first, *multifidum* is inconstant, and not permanent, *i. e.*, neither affecting all the fronds of the plant, nor remaining constant under cultivation; while *ramosum* both affects all the fronds, and remains permanent under cultivation:—secondly, *multifidum* has the apices of the fronds simply dichotomous, and distinct to their extremity, the main mid-vein running out to the extremity of each division of the frond, &c., each of the subdivisions terminating in a

point, and not curled ; while in *ramosum* the apices are subdivided, and the mid-vein terminates in a lash of branches, so that the segments are rounded, and curled on themselves ; in every respect, save their single rachis, bearing a perfect analogy to a form of *Scolopendrium vulgare*, *i. e.*, *ramosum* or *crispum*, where we find the same appearances contrasting with the multifid form of hart's-tongue, as these specimens show. This form of *Scolopendrium* has not, I believe, been found here. I cannot find any forms of any other fern analogous to *Blechnum Spicant* and *ramosum*. The multifid variety, in this country, pervades many other species. It has been found in all the spleenworts, except the wall-rue ; in all the *Lastreas*, except the heath, shield fern, and *L. rigida* ; in all the *Polystichums*, except *P. Lonchitis* ; in the common *Polypody*, the common brake, Killarney fern, and *Grammitis Ceterach* (for which I am indebted to W. H. Luscombe, Esq.), *Botrychium*, and *Ophioglossum*. Of most of these species there are specimens now before you, all gathered in this country, during the last summer, and all agreeing in the general features of being inconstant, not permanent even in the wild plant, and not interfering with the fertility of the frond. The next in our list is the distorted variety of *B. Spicant*. To it, Francis, who describes and figures it in his 'British Ferns,' has given the name of *strictum*. His plants were procured from Ambleside. The plants before you were procured at Glenmacnass, county Wicklow, growing in a cleft of a rock, last July. They have continued under cultivation ever since, without materially altering their character. The only satisfactory analogue to it recorded, is the variety of *L. Filix-mas*, called *abbreviatum*, of which specimens, from Kilmashogue, near Whitechurch, are before you. To the form of the lady fern (*Athyrium Filix-fœmina*), which next engages our attention, several names have been given, of which the least open to objection appears to be *furcatum*. It differs, as you perceive, from the common form in having its pinnæ and the apex of the frond split up into a number of segments, so as to present a tasselled appearance. This specimen was obtained in a hedge-row at Caherpoher, near Feacle, county Clare, growing on clay slate, and has, as you perceive, retained its characters in cultivation. A more singular monstrosity of the same form is figured in Newman's 'British Ferns.' This last was obtained in Mayo, and is remarkable for seeding freely, the seedlings in every respect resembling the original plant. There is also, in the College collection, a fern, obtained at Killarney, by the late Mr. Ogilby, which closely resembles that found by me in Clare ; and Mr. J. Bain, to whom I

am indebted for the careful cultivation of the plants exhibited to-night, informs me that the same form was found by him, some years ago, at Chatsworth. This is the only record of this variety as English, though an allied form (*crispum*) has been recorded in Scotland. This form has been also called, incorrectly, *viviparum*; for the habit of the plant is not viviparous. Another name given to it is *multifidum*, also objectional, as a multifid form of the frond does exist, as this specimen shows, resembling in its characters those multifid forms of other ferns to which I just now drew attention. The only analogue recorded of this is a form of *Lastrea Filix-mas*, to which the same name (*furcatum*) has been given. I should mention that *A. Filix-fœmina*, var. *furcatum*, has been also found in Wicklow. We next in order come to the variety of *Polystichum lobatum*, to which the name of *lonchitidioides* has been given, on account of its resemblance to the holly-leaved shield fern (*P. Lonchitis*). The plants I obtained at Curraghclune Arthur, near Feacle, county Clare, during last August. When cultivated, it is said to resume its original form. It has been recorded as growing at Malone, in Ulster; and I have seen specimens of it sent from Carlow, as *Lonchitis*, but whether wild or garden specimens I cannot say. It is at once distinguished from *Lonchitis*, by the bipinnate character of the lower pinnæ. The fronds are fertile. It is very common in some parts of Scotland. I also show you an analogous state of *P. angulare*, from the neighbourhood of Bray, and a form as yet unnoticed, though I have met with it in many parts of the country. In conclusion, I beg leave again to bring before your Society this variety of *Polystichum angulare*, exhibited before you last session, and to which I then gave the name of *viviparum*, owing to its producing gemmæ in the axils of the pinnules. This is before you now, to show the autumnal fronds, which differ greatly, in their characters, from those produced in the spring, more nearly approaching the character of the typical form. I also beg to submit to you a series of fronds, taken from the plant during each of the years it has been under cultivation, showing you how well the original characters have been preserved ever since."

Dr. Allman, in making some remarks on Mr. Kinahan's paper, referred to the recent discoveries of Count Suminski, concerning the reproductive system of the ferns, and believed that much interest would result from a comparison of the plants produced from the gemmæ described by Mr. Kinahan, in one of the varieties exhibited by him, with those resulting from the germination of the spores. Dr. Allman was, however, of opinion that the spores borne upon the backs

of the fronds of ferns were physiologically identical with buds, and that the history of the development of a fern affords a beautiful example of the "alternations of generations," first pointed out by Steenstrup, as occurring in the animal kingdom.

Mr. Andrews said he was much gratified at the pains Mr. Kinahan had taken to bring forward, and to prove, such varieties of character as many of the more common forms of our ferns presented. Geological characters of country, altitude, exposure or shelter had much effect on the character of growth of plants; and these views should always be noted by the exploring botanist. Varied were the forms to be met with under that of *Lastrea multiflora* and *L. recurva* of Newman, and the *Aspidium dilatatum* of Hooker. *L. recurva*, so frequent in the county of Kerry, is considered to be identical with *Nephrodium Fœnisecii* of Madeira. The forms of *Cystopteris* met with on the limestone rocks of Sligo, and of Clare, were also numerous. The variety of *Polystichum*, according to Mr. Kinahan, producing gemmæ in the axils of the pinnules, was deserving of investigation. The Right Hon. John Wynne, of Haslewood, had cultivated young plants of *Woodwardia radicans* most successfully, producing the growth from the axils of the pinnules. This was a beautiful fern of Madeira and Portugal.

Insects causing the Potato Disease.

Mr. Nuttall read a paper 'On the Insects causing the Potato Disease.'

Mr. Nuttall observed:—"So much has been said and written on the potato disease of late, that the subject appears to have lost its interest; but it certainly has not lost its importance. It is a subject that I have given much attention to for some time. Early in August last, a letter from me appeared in the papers; and since then some objections have been raised to my assertion that the disease was caused by insects. I have now two reports, from scientific friends, before me. One appears to look on the drill-harrow as a sort of infernal machine, and is satisfied that I must be wrong, 'as such views have not been adopted by the scientific world!' Now, being confident that I am right, I have thought it well to bring my views and reasons for them into this, their camp, to be, by them, extinguished, if false, well knowing that truth is a light that cannot be extinguished. Another objects, 'as he has not been able to discover any traces of these insects.' Now, I do not believe that the scientific world is infallible. Some of its members traversed California and Australia,

but left it to a simple shepherd to discover the gold. They are sometimes wrong ; and in the potato disease they have been most unfortunately and pertinaciously so, as I apprehend, very much from want of opportunities for making observations. Thus, when they recommended the taking up of the crop, I left mine in the ground, and came off better than many of my neighbours who lifted theirs. As they did not come in contact in the earth as they would in pits, the disease did not spread. I have made some experiments, to test the power of infection, and found, the first year, that in a few hours a sound tuber would be tainted, when in contact with an unsound one ; and I consider it a good sign that this year the disease is but slightly infectious. To suppose that the same species of insect could not have caused the disease in other parts of the world, is, to say the least, absurd, as every naturalist knows that many of these creatures are common to almost every country, and that some are migratory. The locust, that often lays waste whole provinces in Asia and Africa, has before now visited England. As to the power of insects, look to the formation of coral, see, also, the perforation of the hardest rocks ; and as to the extent of their doings, look to the destruction caused by the cane-fly in the West Indies, another which destroys the meadows of Sweden, and the almost total defoliation and other ruin of vast forests by Aphides. Their fecundity is prodigious ; but I shall not take upon me to say the exact number of fresh eggs they lay in the morning. My friend Mr. Andrews will remember the injury caused by one of the Eriosoma to the silver fir in the county of Wicklow, in 1845, and so well described by him at the time. His plan for banishing them was simple, and most efficacious, and more practicable than that of picking them off, as had been recommended. Soon after the planting of larch-trees in Scotland, they were attacked in a similar way ; and farmers know what the turnip-fly can do in this country. For the last two years, a plant of the *Araucaria imbricata* with me has been attacked by an insect, much resembling, except in colour, the potato enemy, and blackened the leaves of it, and, I think, would have killed the plant, had I not banished them, by dusting with soot. Another was partly blackened ; and, remarking one branch quite green, I was pleased to find that the cause was, that a spider had covered it with his web, and was busily employed with them. Now, I observed a webless spider, last year, very numerous on the potato. Its mission appeared to me to be the destruction of the former insect. I put one in a bottle with about thirty of them, which he killed in an incredibly short time. I have many reasons to hope that, as far as the potato is

concerned, the tide of these insects is about to ebb, and that therefore the disease will disappear, or, at least, go back to its original bounds, as I do not believe it to be of so recent date as is supposed. I have remarked that potatoes have suffered most with a northern aspect. May it not be that these creatures are a squadron of the 'great northern army?' I think it is about 100 years since the curl prevailed to an alarming extent in the south of England; and we still have it in a mitigated form. There are other insects found on potatoes, such as beetles, &c., &c. Some of them have been erroneously supposed to be the enemy, whereas they are waging war upon him. It appears to me that there are two great divisions of insects, those which attack the vegetable kingdom when in health, such as the Aphis, caterpillar, &c., and those which act as scavengers when decay has set in, such as grubs, beetles, &c. In 1847, I had a field of beans blackened in one night. The canker of trees is often, in my opinion, caused by insects. To me, it is rather surprising that a cause so simple, usual, and manifest should be doubted. I have found varieties of these insects on many plants; and in every instance there was the blackened leaf. Is it to be wondered at, the potato, a delicate and not an indigenous plant, being thus injured, and the regular flow of the sap intercepted, that the decay of the tuber should follow? I improved much on the plan that I recommend to sweep off these vermin, the results of which I may possibly bring before you at another time. No doubt, much might be done to check these blights, even in the manuring of the potato. Peat-charcoal or lime has been beneficial, and should be used instead of, or, at least, in conjunction with, other manures. I would also recommend early planting, as the plant would thus have a chance of coming to maturity before being attacked. My potatoes are the best that I have had for years; whilst my neighbours in that mountain district have scarcely any. The oat crop in many parts of Ireland was, last year, what is called blighted. I found, one morning, after walking through a field, that my clothes were covered with what appeared a yellow dust; but I discovered, on examining well, that every particle had life—

'Full nature swarms with life, one wondrous mass
Of animals or atoms organised.'

The following day it was not observable. What if the grain crops now are to suffer? Here, also, as with the potato, some varieties escaped better than others; and those sown early were better than those sown late. Now, although we should not be able to do much

to mitigate the ravages of such creatures, surely it would be instructive to look into the minute works of the same hand that formed the most mighty.

‘How sweet to muse upon His skill displayed,
(Infinite skill!) in all that He has made,
To trace in nature’s most minute design
The signature and stamp of Power Divine.’”

Mr. Andrews remarked “that there was no case more difficult to deal with than the present, nor one that has had so many advocates of such extremely opposite views and tendencies. From the earliest date of the introduction of the potato into Britain, the tuber has been subject to failure, from variableness of climate, or unsuitableness of the tuber for planting; in fact, it has ever been a crop of uncertainty. The great extent to which the potato has been cultivated in this country, is encouraged by the economy of its treatment, the poorer lands it can adapt itself to, and, above all other esculent roots, its nutritive properties as a general and daily food for the poorer classes. A short time since I read an article from the ‘Waterford Mirror,’ published more than thirty years since, detailing losses of the potato crop almost as extensive as those of 1845. We must all admit that the ravages of insects have been most destructive to vegetable life, as endless instances, in every part of the world, can be given. When the vegetative and nutrimentative powers of the stems are cut short, whether affected by insect agency or atmospheric causes, the growth of the tuber must be more or less checked, to the destruction of its mature development. My friend Dr. Bellingham, in this Society, in November, 1845, gave a very able statement of the action of electrical influence on the potato crops, detailing very fully the history and the causes of the disease; and, indeed, in some measure his statements were subsequently borne out. Naturalists well know what injuries had been caused by the several species of *Cecidomyia*, as the Hessian fly, wheat-midge, barley-midge, &c. The plant-mite, or red spider (*Acarus tellarius*), is also most destructive to plants, and even to trees. Practical observations are at all times most valuable, and desired by the Society. Mr. Nuttall has most candidly submitted his experience; yet, on a subject still beset with such difficulties, the patient investigations of science must be brought to bear, before sound deductions can be arrived at.”

Mr. Williams said he had noticed the destructive powers of insects to plants. In the greenhouse, the Oleander was so infested as only to be preserved by constant washing.

Mr. Andrews observed that this was a species of scale insect (*Aspidiotus*). The species were peculiar to many plants.

The ballot was then proceeded with ; and the following gentlemen were declared to be elected members :—Robert Barklie, Esq., 106, Lower Gardiner Street ; F. Nuttall, Esq., Tittour, Co. Wicklow ; — Brown, Esq., Mount Merriion ; and Mr. Wakeman, Grafton Street.

The meeting adjourned to the month of March.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, February 10, 1853.—Professor Balfour, President, in the chair.

Various donations to the Society's library and herbarium were announced, among which were the following :—Leaf taken from a lime-tree which had been planted by Linnæus, in his own garden at Upsal. The tree was pointed out to Mr. Elliot (by whom it was presented) by the only surviving daughter of Linnæus.—Two specimens of larch, showing the absence of the tap-root, and the formation of lateral roots. The following particulars were given by Mr. Graham :—The trees were cut in January last, on property 750 feet above the sea-level. They show the mode in which the roots proceed from the stem. These are preserved to show the fallacy of the theory that the main tap-root is necessary for the upright growth of the stem, and that the lateral roots produce only side branches. Each tree was split into two portions, and planed :—1. Height of tree when cut down, 34 feet 2 inches ; girth, 18 inches from ground, 26 inches ; apparent age (calculated from number of rings), 27 years ; length of leading shoot in the year 1851, 6 inches,—in 1852, 4½ inches. The earlier growth of the tree must thus have been pretty rapid, as the average of the annual shoots is 15 inches. 2. Height of tree when cut down, 7 feet 10 inches ; girth, 1 foot from ground, 7 inches ; apparent age, 7 or 8 years ; length of leading shoot in the year 1851, 15½ inches,—in 1852, 16 inches. Neither of the trees had any tap-root. The roots spread out laterally from the base of the stem ; and yet there was no impediment to the growth of the central axis. The specimens were presented by Humphrey Graham, Esq.

Mr. John Laing, gardener to the Earl of Rosslyn, Dysart House, exhibited a plant of *Rhododendron ciliatum* in flower.

Mr. M'Nab stated that *R. ciliatum* was in flower in the Royal Botanic Garden.

Mr. M'Nab showed a flowering plant of *Begonia argyrostigma* in which the leaves, at the upper part of the stem, exhibited no white, scaly markings; and their under surface was of a pale, greenish purple. The leaves on the lower part of the plant showed the usual markings, and the usual dark colour on their under surface.

Mr. Matthews exhibited a new form of dissecting microscope, made by Pellisher, of London.

Mr. G. Lawson exhibited a specimen of *Oxytropis Uralensis*, collected by Mr. A. Buchan, on the West Lomond Hills, Fife, where he discovered the plant several years ago.

Remarks on British Plants.

A paper intituled 'Remarks on British Plants,' by Charles C. Babington, M.A., F.R.S., F.L.S., was read.

The author stated that since the publication of the third edition of his 'Manual of British Botany,' his attention had been directed to several groups of plants, either by the discovery of new native specimens, or by finding that he had taken an erroneous view of them in that work; and that he purposes giving a series of papers to the Society, embodying the results of his recent observations.

In this paper he commenced with the genus *Thalictrum*, of which he described *T. minus*, *T. flexuosum*, and *T. saxatile*. He considers *T. majus* as not a good species, but as being formed out of larger states of each of these three species. He gives revised characters, dwelling particularly on the presence or absence of leaves at the lower joinings of the stem, the nature of the vaginal portion of the petiole, with its auricular appendages, the direction of the subdivisions of the petiole, and of the branches of the panicle, and the form of the carpels.

The next genus to which he called attention was *Polygala*, of which he described *P. vulgaris* and its varieties, *depressa* and *oxyptera*, *P. calcarea* and *P. uliginosa*. He thinks that, in this genus, attention should be paid to the mode in which the leaves are arranged, and to the appearances caused by the different lengths to which the stems extend each year.

The paper was illustrated by specimens from the Edinburgh University Herbarium.

Dyeing Properties of Lichens.

The second part of Dr. Lindsay's paper 'On the Dyeing Properties of the Lichens' was read.

At the last meeting of the Society, Dr. Lindsay stated that, during the last two years, he has been engaged in occasional researches in different departments of the natural history of the lichens, and that lately the subject of their dyeing properties has chiefly occupied his attention. In reference to the latter subject, he has made several extensive series of experiments, with a view to determine the kind and amount of colouring matter furnished by various native species; the processes being suited, in individual cases, for eliminating these matters, and their special application to dyeing and colouring, &c.; but his efforts have been greatly circumscribed, by a paucity of materials to work upon. He would therefore be very glad to receive, from members of the Society or others, any spare duplicate specimens of native or foreign species (which, for his present purpose, need neither be rare nor fine), or any kind of practical information bearing upon the subject in question. He gave a short, but comprehensive, view of the present state of the different branches of lichenology in this country, and on the continent; and showed, from the aggregate amount of information which is at present possessed thereupon, the great necessity there still exists for renewed and extended experimental investigation. The author then considered:—1. The vast importance of this humble tribe of plants in the grand economy of Nature, as the pioneers and founders of *all* vegetation. 2. Their importance to man and the lower animals, as furnishing various articles of food. 3. Their importance in medicine, and especially in its past history, at home and abroad. 4. Their importance in the useful and fine arts, and especially in the art of dyeing. 5. Their affinities and analogies to other cryptogamic families, and to the Phanerogamia. 6. Their value as an element of the picturesque in Nature. 7. Their typical significance.

The author then adverted more especially to the subject of his communication, under the ten following heads:—

1. The colours of the thallus and apothecia of lichens, their causes, and the circumstances which modify and alter them.

2. History of the application of their colouring matters to the art of dyeing.

3. Chemical nature and general properties of these colouring matters.

4. Tests and processes for estimating qualitatively and quantitatively the colorific powers of individual species, with their practical applications.

5. Processes of manufacture of the lichen-dyes, on the large and small scale, in different countries, with the principles on which they are founded.

6. Nomenclature of the dye-lichens, and of the lichen-dyes.

7. Botanical and commercial sources of the same.

8. Special applications of the lichen-dyes in the arts.

9. Commercial value of the dye-lichens, and their products.

10. Geographical distribution of the dye-lichens, with the effect of climate, situation, &c., on their colorific materials.

In the former part of this paper, the subjects mentioned under the 1st and 2nd of these heads were considered, and on the present occasion those included in the 3rd and 4th. Of these four sections of the paper, the following is a very short summary, or synopsis:—

Under the 1st head, the author spoke of chlorophylle, and various organic and inorganic substances which enter into the formation of the colours of the thallus and apothecia of lichens, and of the modifications of these colours depending on various degrees of—1. Exposure to air and light. 2. Temperature. 3. Moisture, &c. 4. Atmospheric vicissitudes. 5. Season of the year. 6. Nature of the gonidic reproduction (*i. e.*, gemmation). 7. Nature of habitat. 8. Organic decomposition. 9. Coalescence of parts, monstrosities, &c.

Under the 2nd section, he traced historically the manufacture of lichen-dyes, and the native use of lichens as dye-agents, among different nations, from the times of Theophrastus, Dioscorides, and Pliny down to the present day; sketching briefly the ancient and modern history of orchil, cudbear, and litmus, and specifying the native use of lichen-dyes in different countries of Europe, Asia, and America. He alluded more particularly to their application to the dyeing of yarns, &c., by the Scotch highlanders, under the name of “crottles.” “The process of manufacture of the various crottles, generally consisted in macerating the powdered lichen for two or three weeks in stale urine; exposing the mass freely to the air, by repeated stirring, and adding lime, salt, alum, or argillaceous and other substances, either to heighten the colour, or impart consistence. To such an extent did this custom at one time prevail, that, in several of our northern counties, each farm and cottage had its tank or barrel of putrefying urine,—a homely, but perfectly efficient, mode of generating the necessary amount of ammonia. In the county of Aberdeen

in particular, every homestead had its reservoir of 'graith;'* and the 'lit-pig,'† which stood by every fire-side, was as familiar an article of furniture in the cots of the peasantry as the 'cuttie-stool,' or the 'meal-girnel.' So lately as 1841 (and I presume the practice continues to the present day), Mr. Edmondston stated that, of four or five native dyes used by the Shetlanders to colour cloth and yarns, two, at least, were furnished by lichens, *viz.*, a *brown* dye from *Parmelia saxatilis*, under the name of 'scrottyie,' and a *red* one from *Lecanora tartarea*, under that of 'korkalett.' It is very probable, however, that steam and free trade have gradually dispelled this good old custom, even in the remoter corners of our island; machinery-made articles being now readily supplied at a rate so extraordinarily cheap, as to render it absolutely expensive (as to time, if not also as to money) to prepare colours, even by a process so simple and inexpensive as that just mentioned."

Under the 3rd head, the author examined, in a general way, the chemistry of the colorific and colouring matters of the lichens, and the results to which it has led, avoiding as much as possible the technicalities inseparable from such a subject, and giving a short *visé* of the researches of Heeren, Kane, Rochleder, Heldt, Stenhouse, Schunck, Laurent, Gerhardt, and others. "Our untaught senses should undoubtedly lead us to expect the lichens, whose thallus exhibits the brightest tints, to yield the finest dyes, and these, too, of a colour similar to that of the thallus; but experience teaches us that the beautiful reddish or purplish colouring matters are producible, in the greatest abundance, by the very species from which we should least expect to derive any, *viz.*, in those most devoid of external colour. This, though at first sight very remarkable, is easily explicable, when we remember that, in most of the so-called dye-lichens, colorific principles exist in a colourless form, and only become converted into coloured substances under a peculiar combination of circumstances.

"Some lichens contain colouring matters ready formed; and these exhibit themselves in the tint of the thallus of the plants; *e. g.*, chrysophanic (or parietinic) acid in *Parmelia parietina*, and vulpinic acid in *Evernia vulpina*. In other species, we find principles which, while in the plant, and unacted on by chemical reagents, are colourless; but which, when the lichens are exposed to the combined influence

* The vernacular name for stale or putrid urine.

† "Lit" was the name applied to the plant from which the dye was to be prepared; and "pig" is the Scotch synonym for any kind of earthenware vessel in which the maceration was generally carried on.

of atmospheric air, water, and ammonia, yield coloured substances. This series of coloured products is usually comprehended, more for convenience' sake than on account of chemical identity, under the generic term orceine." The whole subject of the chemistry of these bodies is at present in a most unsatisfactory condition, demanding fresh investigation and research, in illustration of which the author exhibited tables of the colorific and colouring principles, so far as they are at present known, showing their chemical formulæ, and the authority therefor, and various relative information. "It is highly probable that, when the chemistry of the lichens has been more fully studied, and the whole subject of their colour-educts and products better understood, we shall begin to reduce the present confused mass of complex substances, and find the same principles more extensively diffused through different lichen species." Dr. Lindsay entered somewhat minutely on the chemical reactions of the better-known colorific and colouring principles, and their derivatives, so far, at least, as these throw any light on the production and transmutation of the red or purple colours extracted from what may be termed, *par excellence*, the dye-lichens. After a few remarks on the chemical constitution of orchil and litmus, as given by Kane, Gelis, Pareira, and others, he discussed the subject of decolorization of weak infusions of orchil and litmus by exclusion of atmospheric air, and by various deoxidizing agents, and the various theories as to the causation of this phenomenon. "I have repeatedly had occasion to notice that, when weak infusions of these substances are excluded for some time from atmospheric air, in a bottle with a tightly-fitting cork, they gradually lose colour, but rapidly regain it on re-exposure. It is curious that both orchil and litmus are what are called transient or false colours, *i. e.*, they slowly lose their bloom and tint by long exposure to the atmosphere. The colouring matter therefore appears to be decolorized, both by exposure to and exclusion from the air,—phenomena, apparently, of very opposite characters. The cause of the latter phenomenon has never, so far as I am aware, been quite satisfactorily explained; but it has been variously supposed to be due—

"1. To the mere negation of oxygen.

"2. To the development, in the liquids, of various substances capable of exerting a decolorizing influence on the colouring matter.

"3. To deoxidation of the colouring matter by substances which have a great tendency to become oxidized or peroxidized; *e. g.*, hydrogen in the case of decolorization by sulphuretted hydrogen, nascent hydrogen, and the protoxides of iron and tin, &c.

"4. To the fixation of an additional amount of hydrogen in a new colourless body, formed by the union of the sulphuretted hydrogen or other substances with the colouring matter of the liquid. This view is chiefly supported by Kane, who says, 'that precisely as the colouring matters combine with water, to form different shades of red-coloured bodies—with ammonia, to produce a series of bodies, which are blue and purple—so they combine with sulphuretted hydrogen, to form colourless compounds in solution, which, if solid, would very probably be white.' He supposes, in a word, that for every coloured substance existing in orchil and litmus there is a corresponding white one, producible by the action of sulphuretted hydrogen, &c. ; and in proof of this theory he mentions having obtained from azolitmine and betaorceine colourless bodies, to which he gave the respective names of leuco-litmine and leuco-orceine."

The author then gave a short summary of Dr. Westring's experiments on the dyeing powers of the Swedish lichens, which, he found, might be conveniently divided into four classes, according to the degree of heat employed in their maceration, *viz* :—

1. Lichens whose colouring matter was easily extractable by *cold* water alone.

2. Those which required, for the elimination of their colouring matter, maceration in *tepid* water (*i. e.*, below 25° Swedish thermometer).

3. Those which required maceration in *warm* water (*i. e.*, between 50° and 60° Swedish thermometer).

4. Those requiring *boiling* water, alone or with the aid of solvents.

"It must be admitted that our knowledge of the true nature of the colorific and colouring principles of the lichens is as yet very imperfect and confused ; and one great cause of the dubiety and obscurity overhanging the subject, is the fact that different analysts have arrived at most opposite results, even in the examination of the same species. For instance, *Rocella tinctoria*, which has, of all the dye-lichens, been most frequently selected for analytical investigation, on account of its important product, orchil, the discrepancies between the results obtained are very striking. In it, Heeren discovered his *erythrine* ; Kane, *erythriline* ; Schunck, his *erythric acid* ; and Stenhouse, three different substances, in as many varieties of the plant ; all of these bodies differing more or less from each other in composition and properties (at least, if we are to assume as correct the descriptions given of them by their respective discoverers)."

"I have already hinted that there is no ratio between the external

and internal colour or structure of a lichen, and the kind or amount of colouring matter it will be found to yield. It is exceedingly natural to suppose that such a ratio should exist; but, proceeding for some time on this supposition, I was frequently disappointed in my results; the most showy and brilliantly-coloured lichens often furnishing the dullest and most worthless colours. For instance, the bright yellow thallus of *Parmelia parietina*, and the beautiful scarlet apothecia of *Scyphophorus cocciferus*, instead of producing a rich yellow in the one case, and a deep crimson in the other, yielded, respectively, only dirty greenish-yellow and brownish colours. As a general rule, I should almost be inclined to say, that the finer the colour of the thallus of any given lichen, the more is that lichen to be suspected of poverty in valuable colouring matters; and that, on the other hand, the palest pulverulent or crustaceous species, especially such as are saxicolous, may be expected to yield the most beautiful and valuable pigments (*e. g.*, the *Roccellas* and *Lecanoras*). In such circumstances, it is necessary to have some test, of easy applicability, of the kind and amount of colorific properties of any lichen; and this, fortunately, is readily attainable."

The 4th section of the paper was devoted to the consideration of the various tests of colorific power which have been recommended by different authors. "Of these, the greater number proceed on the principle of developing the colouring matter by some alkali, in conjunction with the decomposing action of atmospheric oxygen and water; others are founded on the reaction between the colorific principles of certain of the dye-lichens, and some of our ordinary chemical reagents." The author noticed in particular—

- | | | |
|---------------------|---|---------------|
| 1. Helot's test | } | qualitative. |
| 2. Westring's tests | | |
| 3. Stenhouse's test | | |
| 4. „ | | quantitative. |

"Helot's test consists in digesting the dried and powdered lichen for a few hours, at a temperature of 130°, in a weak solution of ammonia, sufficiently strong, however, to be tolerably pungent.

"Dr. Westring recommended simply macerating three or four drachms of the lichen in cool spring water, assisting, perhaps, the solvent action of the water by minute quantities of common salt, nitre, quicklime, sulphate of copper or iron, or similar reagents. If these means failed after a sufficient length of time had been allowed for the development of colour, he digested a fresh portion of the pulverized lichen, in water containing small quantities of sal ammoniac

and quicklime (in the proportion of 25 parts of water, 1-10th lime, and 1-20th sal ammoniac for every part of lichen), for a period varying from eight to fourteen days; and by this process, he says, he never failed to develop all the colour which the plant was capable of yielding.

“Dr. Stenhouse, of London, one of our latest and best authorities on the chemistry of the lichens, adds to an alcoholic infusion of the lichen a solution of common bleaching-powder (chloride of lime), whereby, if it contain certain colorific principles capable of developing, under the joint action of air, water, and ammonia, red colouring matters, a fugitive, but distinct, *blood-red colour* will be exhibited. The amount of this colorific matter may be estimated quantitatively by noting the quantity of the chloride of lime solution required to destroy this blood-red colour in different cases; or the same result may be obtained by macerating, for a short period, in milk of lime, filtering, precipitating the filtered liquid by acetic or muriatic acid, collecting this precipitate on a weighed filter, drying at ordinary temperatures and again weighing.”

The author entered into a full analysis of these tests and processes, pointing out their respective advantages and disadvantages, and showing their practical value and applications. He stated that he had made use of these and various other tests in upwards of 300 experiments (the details of which he at present reserves); and the one which he employed to the greatest extent, because most uniformly applicable, was Helot's ammonia test. The following combination is that most favourable for the development of the colouring matter of the lichens, *viz.*, the presence

1. Of *water*, as a solvent menstruum;
2. Of atmospheric *oxygen*;
3. Of *ammonia*, in the state of vapour, or in solution; and
4. Of a moderate degree of *heat*.

And according as the proportion of these combining elements varies, so do the kind and amount of colour educed by them. This combination is the foundation of all the processes for the manufacture of the lichen-dyes throughout the world, however different they may appear to be in detail or results.

“I believe it may come to be a matter of great commercial importance to discover, at home or abroad, some cheap and easily procurable substitute for the Roccellas, which are gradually becoming scarce, and consequently valuable in European commerce, having sometimes fetched, in times of scarcity, no less than £1000 per ton.

No plants can be so easily collected and preserved as lichens, requiring merely to be cleaned, dried, pulverized, and packed ; and, if their bulk be an objection to transport, their whole colorific matter may be collected in the way I have already mentioned. Ascending to the verge of eternal snows, and descending to the ocean-level, with a geographical diffusion that is coextensive with the surface of our earth, it is difficult to say where lichens shall not be found. There are myriads of small, rocky islets in the boundless ocean, and there are thousands of miles of barren, rocky coast and sterile mountain-range in every part of the world, which, though at present unfit to bear any of the higher members of the vegetable kingdom, yet are carpeted and adorned with a rich covering of lichens, and of those very species, too, which I have already spoken of as most prolific in colorific materials. I sincerely believe, therefore, that a more general attention to the very simple tests just enumerated, would ultimately result in a greatly more extended use of the lichens as dye-agents. What renders it very probable that efforts in this direction are likely to meet with success, is the great similarity of species found all over the world. It has been repeatedly noticed that the European species, which, of course, are best known, differ little from those of North America. Dr. Robert Brown remarked the same fact with regard to New-Holland species ; and Humboldt also recognized the similarity in natives of the South-American Andes. Of a large collection made by Professor Royle, in the Himalayas, Don pronounced almost every one to be identical with European species. From examining the raw vegetable products sent by different countries to the Great Exhibition of 1851, I am satisfied that even now there are many fields open for the establishment of an export trade in Roccellas and other so-called orchella-weeds. I there saw specimens of good dye-lichens from almost every part of the world, including our own young colonies ; and as a single instance of their probable value I may introduce here the copy of a note appended to a specimen of orchella-weed, from the Island of Socotra, contained in the Indian collection of that Exhibition :—‘ *Abundant*, but *unknown* as an article of use or commerce. Also abundant on the hills around (Aden), and *might* be made an article of trade. Aden, April, 1847.’ Roccellas from this source are estimated as worth £190 to £380 per ton. I believe that a similar statement might be made with regard to the countless islands of the broad Atlantic and Pacific, which may at some future period, perhaps not far distant, be found to be rich depôts of orchella-weeds, just as some of them are at present rich fields of guano ; and may, as such,

become new nuclei of British commerce and enterprize. Even at home, in the immediate vicinity of Edinburgh, or, to restrict our limits still more narrowly, within the compass of Arthur's Seat, there are not a few very good dye-lichens, which require merely to be scraped, with an old knife or similar instrument, from the rocks to which they adhere, and subjected to the ammonia process already mentioned. Of twelve specimens thus collected at random one morning, I found no less than three yielded beautiful purple-red colours, apparently as fine as orchil or cudbear; while the others furnished rich and dark tints of brownish red, brown, and olive-green."

Dr. Lindsay's communication was illustrated with specimens of colouring matters yielded by various lichens collected in the neighbourhood of Edinburgh, &c.

Asplenium germanicum, &c., at Kylloe, Northumberland.

A paper by George R. Tate, Esq., 'On the Occurrence of *Asplenium germanicum*, *Convallaria Polygonatum*, and other Rare Plants, at Kylloe, Northumberland,' was read.

Mr. Tate remarked that, during a botanical excursion in the autumn of last year, he had visited Kylloe Crags, in Northumberland, for the purpose of gathering *Asplenium septentrionale* and *Convallaria Polygonatum*. "These crags are chiefly composed of rudely-columnar basalt, resembling the trap-range of Salisbury Crags. Sandstone comes out from beneath this, and at the western end forms a steep cliff. After botanizing for a short time, I had the good fortune to find the *Asplenium germanicum* growing sparingly upon the basalt. It is not a fern easily passed by: its pale green fronds at once attracted my attention; and a closer examination readily enabled me to determine its species. The few specimens I observed were remarkably luxuriant, so much so, indeed, that I counted upwards of thirty fronds growing on a single root. There appeared to be no possibility of the plants having been introduced. This *Asplenium* is most nearly allied to *Asplenium Ruta-muraria*, from which, and from the other species of the genus, it is distinguished by its alternately pinnate frond, narrow, wedge-shaped pinnules, and entire involucre. Some regard *Asplenium germanicum* as a variety of *A. Ruta-muraria*; but, as the latter does not occur at Kylloe Crags, or in their vicinity, the supposition is by no means probable. *A. septentrionale* still exists, in considerable abundance, on the high and exposed portions of the crag, as well as among the *débris*. Many of the specimens, especially those in the latter situation, are of large

size. I succeeded in obtaining *Convallaria Polygonatum*, in fruit. This plant was recorded by Wallis, in his 'History of Northumberland.' Since his time, no one appears to have gathered the species; and it was supposed that it had either become extinct, or the name had been misapplied, until, after the lapse of more than 100 years, it was re-discovered by the Berwickshire Naturalists' Club, in 1849. Specimens are obtained with great difficulty: many of them are inaccessible. *Viola hirta* and *Euonymus europæus* occur sparingly. Opposite the crags on the moor, I observed *Lycopodium Selago*, and a variety of *Pinguicula vulgaris*, with a larger flower than usual, and with a spur notched at its extremity."

Mr. M'Nab gave the following list of plants in flower, in the open air, in the Royal Botanic Garden, on the 1st of February, 1853:—*Eranthis hyemalis*, *Galanthus nivalis*, *Potentilla Fragariastrum*, *Sisyrinchium grandiflorum*, *Helleborus odoratus*, *H. orientalis*, *H. niger*, *H. viridis*, *H. atro-rubens*, *H. olympicus*, *H. olympicus rubra*, *Rhododendron atrovirens*, *Hepatica triloba* (numerous varieties), *Aubretia grandiflora*, *Primula vulgaris*, *Lamium album*, *Tussilago fragrans*, *Daphne Mezereum*, *D. Laureola*, *Erica herbacea*, *Cornus mascula*, *Knappia agrostidea*, *Tritonia media*, and *Viola odorata*.

The following gentlemen were elected Resident Fellows of the Society:—John Sutherland, Esq., Surgeon, H.E.I.C.S., 8, Hope Street; and William G. Johnston, Esq., Greenbrae Cottage, Dumfries. Mr. Neil Stewart, Artist, 8, Roxburgh Terrace, was elected an Associate.

Thursday, March 10, 1852.—Professor Balfour, President, in the chair.

Donations to the library and herbarium were announced as follows:—From Messrs. P. Lawson & Son, the new edition of their 'Agrostographia;' and from Dr. Holden, a collection of plants from the neighbourhood of the Cape of Good Hope.

Dr. Holden made some remarks on the Cape plants presented by him, and exhibited a double prickly from a *Mimosa*; the length of each division of the prickly being four or five inches. He stated that insects frequently perforate the prickles, and form their habitations within them.

Professor Balfour exhibited, from the Royal Botanic Garden, a plant of *Acrostiche ramiflora* in flower, and made some remarks on

its characters. He also called attention to a specimen of *Hibiscus* in flower, from Ceylon, sent to the Botanic Garden by Admiral Mitford. It appears to be *H. furcatus*.

Mr. Laing, gardener to the Earl of Rosslyn, Dysart House, exhibited a plant of *Rhododendron glaucum* in flower; also *Lomatia silaifolia* in flower.

Dr. Lowe exhibited specimens of branches of apple-trees showing peculiar wart-like excrescences, which were said to be produced by a species of *Aphis*.

Dr. Balfour exhibited various recent donations to the Museum of Economic Botany at the Royal Botanic Garden, among which were the following, from Dr. Holden:—Specimen of caoutchouc from an African *Euphorbia*; specimens of a plant said to be used in the Mauritius as a febrifuge, and in cases of indigestion, called “*Japana*,” or “*Tapana*,” and of another plant, called “*Koma Koma*,” or worm-root, used as a vermifuge, from Fort Murray.

Palms, Bamboos, Pines, &c., on the Himalaya.

A paper by Major Madden, H.E.I.C.S., F.R.S.E., ‘On the Occurrence of Palms and Bamboos with Pines, and other Northern Forms, at considerable elevations on the Himalaya,’ was read.

In this paper, the author gave an account of various plant-forms which are met with in the Himalaya, and showed the association of plants, which are often said to represent tropical forms, with others which are said to be characteristic of temperate or cold regions. He noticed *Phoenix humilis*, *Chamærops Khasyana*, *Harina oblongifolia*, species of *Arundinaria*, *Thamnocalamus*, *Musa*, *Quercus*, *Acer*, *Rhododendron*, *Pinus*, &c., growing at elevations varying from 5 to 10,000 feet. He concluded by drawing the attention of geologists to the importance of these facts, as bearing on their views in regard to the climate of former epochs of the earth’s history; and by showing that in drawing inferences as to climate we can only do so safely by a consideration of the individuals of each species, and not by that of the whole species of a genus. When we find species of palms, bamboos, and banana growing amongst and above pines, cedars, oaks, cypresses, yews, maples, hazels, and ash, it seems to be very rash to draw conclusions, in regard to climate, from mere generic data.

The paper was illustrated by large drawings of the principal palms, &c., noticed, and also by plants of *Phoenix humilis*, from the Royal Botanic Garden (presented to the Garden, by Mr. Moore, of the Glasnevin Garden); the hemp-palm of China (presented by Messrs.

Standish and Noble, of the Bagshot Nurseries); *Arundinaria falcata*; &c.

In remarking upon Major Madden's researches, Professor Fleming observed that their results were peculiarly gratifying to him, in so far as they afforded another proof of views which he had endeavoured to argue for more than a quarter of a century.

Hypericum anglicum, *Agrimonia odorata*, and *Matricaria maritima*.

The second part of Mr. Babington's paper intituled 'Remarks on British Plants' was read.

In this paper, the author described some newly-observed British species.

Under *Hypericum Androsæmum*, he described a plant, found by Dr. Balfour, at Glanmire, near Cork, in August last, which differs from that species in its winged pedicels, more acute leaves, narrow calycine segments, which do not enlarge in fruit, long petals (twice the length of the calyx), long styles, equalling or exceeding the stamens, and oblong, acute capsule. The plant seems to be *H. anglicum*, Bertol.

Another plant mentioned was *Agrimonia odorata*, distinguished from *A. Eupatorium* by the tube of the fruit being bell-shaped, not furrowed, and the exterior spines of the fruit declining.

The author concluded by giving the characters of *Matricaria inodora*, with its var. *salina*, and *M. maritima*. He is disposed to consider these two plants as good species, although the characters are not easily defined. The latter has a diffuse stem, fleshy leaves, basal leaflets few, and separated from each other, phyllaries oblong, blunt, scarious (pale), entire (not torn) in their margins.

Dr. Balfour stated that the *Hypericum* called *H. anglicum* had been observed by him, in large quantity, apparently wild, on the banks of the Glanmire River, near Cork. The plant had also been seen by Mr. Sibbald, at Aghada; and Dr. Balfour exhibited a specimen picked by him near Culross, in July, 1833, which seemed to be the same plant. Another specimen, gathered near Galway, in August, 1838, resembled the *H. anglicum* in the size of its petals, length of styles, and form of capsule.

Dr. Balfour exhibited a specimen of *Matricaria maritima*, from Marseilles, which seemed to differ, in its remarkably pale phyllaries, as well as in its leaves, capitulum, and habit, from any British form he had seen.

Remarkable Formation of a Stem-root in a Willow.

A paper by John Lowe, Esq., of Gainsborough, 'On a Remarkable Formation of a Stem-root in the Decayed Trunk of a Willow,' was read. The paper was communicated by Dr. Balfour.

A sketch was exhibited of a large willow, in which a root had been developed, in a peculiar manner, so as to form a main stem. Mr. Lowe observed :—"The tree (*Salix viminalis*) having become decayed in the centre, a root had evidently been sent down by a portion of the upper extremity of the tree, through the rotten, sponge-like substance which filled up the interior. Feeding upon this, and the moisture absorbed by it, the root at length reached the ground, where it established a firm hold. The circumference then died away, until, the root now taking on the functions of the stem, and becoming entirely denuded, at length became the only support of the living top. The remaining part of the periphery only acts as a mechanical support. The circumference of the root-stem is eighteen inches at top, and thirteen at the bifurcation, and about three feet above the ground. It has latterly taken on more stem-functions, by putting forth several branches. The tree is growing near Sleaford, where I have observed its progress for some years."

The reading of several papers was delayed till the next meeting of the Society.

A. G. More, Esq., of Trinity College, Cambridge, was elected an Ordinary (Non-Resident) Fellow.

THE PHYTOLOGICAL CLUB.

A Botanical Association has recently been organized, with the above title. Its objects are thus stated :—

"The Phytological Club is established by individuals connected with the profession of Pharmacy, who have associated themselves for the purpose of mutual assistance in botanical pursuits. Amongst its means for effecting this object, are the following :—The formation of an herbarium of reference, the exchange of specimens between members, the collection of facts relating to the popular uses of indigenous plants, and correspondence with botanists in other countries, when opportunities offer."

The first meeting of the Club was held on Monday evening, March 7, 1853; the President, Robert Bentley, Esq., F.L.S., in the chair.

Donations to the herbarium were announced as follows:—Specimens from the South-Sea Islands, by Mr. E. May, Jun., Tottenham; British plants from Messrs. Brady (Leeds), Copney (Plymouth), Parker, and Reynolds (London).

The President gave an inaugural address, which was listened to with much interest.

A paper by Mr. H. B. Brady, of Leeds, announcing a new Yorkshire station for *Hymenophyllum Tunbridgense*, was read.

Effects of Ammonia upon Vegetation.

Mr. Penney presented a translation of M. Ville's papers 'On the Effects produced upon Vegetation by Ammonia added to the Air,' which were published in the 'Comptes Rendus' of October 4 and November 2, 1852.

Henry Deane, Esq., Vice-President of the Pharmaceutical Society, sent a communication confirmatory of M. Ville's statements, being an account of some experiments, made at various periods during three or four years, upon plants in greenhouses. The plants were watered with solutions of ammoniacal salts; and the resulting phenomena were similar to those recorded by M. Ville.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-third Sitting.—Saturday, March 26, 1853.

MR. NEWMAN, President, in the chair.

Gymnogramma leptophylla in the Channel Islands.

The President had heard, through the kindness of his friend Mr. Henry Hagen, that this pretty little species had been found growing on a bank in Jersey. It appears that the late lamented Mr. William Christy, so well known for his enthusiastic love of botany, resided for some months near the spot where the species occurs; and it is also a fact that *Gymnogramma leptophylla* was a fern which Mr. Christy took great pleasure in cultivating, raising it, year after year, from seed; but no evidence has yet been offered to show that he attempted to introduce it into the Channel Islands.

Nees von Esenbeck.

The President had received the following letter from Professor Nees von Esenbeck :—

“ Breslau, March 8, 1853.

“ Respected Sir and Friend,

“ I beg to acknowledge, with feelings of most sincere gratitude, the receipt of £20, for which I am entirely indebted to your exertions. I wish to express to you, and to every one, that the sympathy which has rescued me from the most bitter want originated with yourself. Subsequently to your advocacy of my cause, my old friends and fellow-labourers, Robert Brown, Hooker, and Wallich, have assisted me with extreme benevolence ; but to you belongs the high merit of having first recognized my distress, and of having afforded help at the right time. For this, may God reward you. My blessings, and those of my family, will ever accompany you.

“ My sufferings are now so far relieved, that my daily requirements are fully provided for ; and I can now resume my works for the Academy of Natural Philosophy. Still, I am yet unable to accomplish what I ardently desire, namely, the laying by a few hundred dollars, the income from which might, with rigid economy, save me from ever again falling into want.

“ You will perceive that I address you as a friend ; and I wish the sentiments which I have expressed published to the world, through the medium of your journals ; and my thanks thus communicated to those who have so nobly contributed to my support.

“ With my whole heart, I am, and remain,

“ Yours gratefully,

“ NEES VON ESENBECK.”

“ To Edward Newman,
&c.; &c., &c.”

Asplenium viride at Danny.

The President had received a communication from a friend, calling his attention to a fact noticed in Derham's ‘ Remains and Life of Ray,’ namely, that that great botanist was a resident at Danny at the latter end of 1667, and for a portion of 1668. This suggested the idea that *A. viride*, as well as *Ceterach* and *Dryopteris*, may have been introduced to the locality, two hundred years ago, and have maintained a footing ever since ; the locality being hardly likely to

produce the three species mentioned, without some assistance from the hand of man. He wished the information as to *Dryopteris* were more complete.

Stems of Ferns as an Article of Food.

The following extract from 'Travels in Tartary, Thibet, and China,' by Mons. Huc, was read :—

“ A dish much distinguished in our esteem, was furnished by a plant very common in France, and the merit of which has never yet been adequately appreciated ; we refer to the young stems of Fern ; when these are gathered quite young, before they are covered with down, and while the first leaves are bent and rolled up in themselves, you have only to boil them in pure water to realize a dish of delicious *Asparagus*.”

BOTANICAL SOCIETY OF LONDON.

Friday, February 4, 1853.—Arthur Henfrey, Esq., V.P., F.R.S., in the chair.

The following donations were announced :—‘ Reports by the Juries on the Subjects in the 30 Classes into which the Exhibition was divided ;’ presented by the Royal Commissioners. ‘ Second Report of the Commissioners of the Exhibition of 1851 ;’ presented by the Commissioners. ‘ Journal of the Royal Agricultural Society of England ;’ presented by the Society. ‘ Quarterly Journal of Microscopical Science ;’ presented by the publishers. The ‘ *Zoologist*’ for January, 1853 ; presented by Mr. E. Newman. ‘ Journal of the Statistical Society of London ;’ presented by the Society. ‘ Report of the Council of the Art Union of London, for 1852 ;’ presented by the Council. ‘ Journal of the Society of Arts ;’ presented by the Society.

Mr. Richard Bardin presented a collection of plants collected by him on the last expedition sent in search of Sir John Franklin.

Mr. A. Irvine exhibited a specimen of *Asplenium fontanum* collected at Ashford, near Petersfield, Hants.

Mr. J. T. Syme read a paper, being ‘ Notices of the Localities of Rare Plants in the Neighbourhood of London.’ (See p. 859).

Supplementary Account of the British Rubi, with Remarks on their Physiology and Distribution. By EDWIN LEES, Esq., F.L.S.

THE editor of the 'Phytologist' having reprinted the description I gave of the fruticose Rubi in my 'Botany of the Malvern Hills,' under a *general* title, it almost renders it necessary for me to attempt to make the subject more perfect, by adding those forms which did not come under my notice in the Malvern Flora. Some misapprehension may otherwise occur, as it may be supposed that I have mentioned all the British species that I was acquainted with.

It may be well here, also, to hint to the observer a point not constantly noted, or properly acted upon, as to what is really a type, and what only a variety, amongst brambles. An excessively-developed form, however fine or characteristic it appears at first sight, may be generally presumed an over-luxuriant individual, and not the general appearance of the species. Thus, the type of *R. cæsius* is the universal prostrate form, with its well-known pruinose stem, which, when supported in hedges or thickets, often assumes a much more robust and branching aspect, and in the remarkable var. *pseudo-Idæus* is firm and suberect. Applying this principle to other forms, a clew is obtained to their origin; and I have thus identified the overgrown *R. Schlechtendahlii*, *W. & N.*, as completely connected with my *R. amplificatus*, so common in most of our woods. The same rule applies to the well-marked *R. Sprengelii*, with which Dr. Bell-Salter has curiously combined the names of four botanists—Sprengel, Borreri, Wilson, and Weihe. But, as the three described appearances of this bramble, α , β , and γ , are assigned as Borreri, Wilsoni, and Weihei, the wreath left for poor Sprengel in this arrangement is scarcely distinguishable. Mr. Babington has reversed the matter, in his Manual, by giving Sprengel the second place, as β ; but surely the typical form ought always to coincide with the specific name. In fact, in its commonest form *R. Sprengelii* grows, in its woody habitat, *prostrate*, and with short flowering stems, in analogy with *R. cæsius*; and in exposed places it becomes more tall, upright, and thorny. This is the variety termed *Borreri*, and, in agreement with my observation, must rank accordingly; though it might be preferred that the eminent British botanist should have a species of his own, as Dr. Bell-Salter no doubt intended. But botanical honours are often transient; and the rude foot of the "lumper" crushes remorselessly the hope of immortality based only on a name. By the same analogy

of growth I have been mentioning, I infer that Mr. Babington's "pyramidalis" is, in fact, a dilated form of *R. Menkii*, *W. & N.*, for I have distinctly traced the connexion between the two; and intermediate states occur; but *Menkii* is the smaller and typical form. Mr. Babington has himself marked this rule with correctness of observation, under *R. Guntheri*, to which I agree, with him, that *R. thyr-siflorus*, *W. & N.*, is to be referred, as an overgrown variety; and what I called *R. thyr-siflorus*, in Steele's 'Handbook,' from Devonshire specimens, now proves to be decidedly a large thyr-sifloral variety of *Guntheri*.

I am not very well acquainted with *R. Salteri*; but Dr. Bell-Salter has referred my friend Bloxam's "*Balfourianus*" to it, as a variety, which fully coincides with my ideas, as this last I know to be quite a gigantic bramble, with very large foliage, and a widely-dilated panicle. Indeed, most permanent forms of bramble will be found to have a variety with long thyr-siform panicles; and both *R. fuscus* and *R. Bellardi* well display this. So, also, does the var. *macroacanthus* among the hairy-stemmed *Rubi*.

It is now generally admitted that the fruticose brambles are not strictly biennial shrubs; and I have named the principal division of the group "subperennial," as existing for an indefinite time, though not absolutely *perennial* like a rose-bush. If circumstances are unfavourable to the barren shoot of the year rooting in the ground, it throws out other proliferous barren shoots the second year; and thus the system of vitality is maintained for a considerable period.* In fact, many brambles are almost evergreens, flourishing through the winter, if no very severe frosts intervene. I have noticed numerous old shrubs of *R. discolor*; and one of *R. Schlechtendahlia*, in Cowleigh Park, near Great Malvern, has maintained itself, to my knowledge, for more than fifteen years. It has now enormously thick stems. Thus, an underwood of bramble of one particular kind will long remain in a copse, till suddenly its vitality becomes exhausted, and a wide extent of withered thorns meets the surprised eye of the observer, not to be renewed, exactly in that spot, for years to come. The sub-erect brambles, however, may be said to be more truly biennial, though even these often throw out flowering shoots from the old barren stem a third year. The vestiture of the barren shoot of the year, towards its base, offers the best guide to the sectional position of the plant.

* Secondary axillary rooting shoots are occasionally thrown off from the barren stem, and even from the branches of the flowering panicle.

I shall now briefly characterize those forms of British Rubi that did not come under my notice in the Malvern district.

Subdiv. i. RUBI CÆSII.

R. Salteri, Bab. "Stem angled slightly hairy, prickles small, leaflets elliptic acute, panicle compound."—*Bell.-Salt.*

I am not acquainted with this bramble, except from a dubious Cheshire specimen, sent me by the late Mr. S. E. Wilson, which seems much like my *R. sublustris*; and it is placed by Dr. Bell-Salter himself next to *corylifolius*. It is said, however, to spread abundantly by creeping stolons, which has hitherto been only observed of the Idæan Rubi. It is stated to be "rare,"—its head-quarters the Isle of Wight. With this, Dr. Bell-Salter has placed the following, as a variety; but, until better known, it may be advisable to describe it separately.

R. Balfourianus, Blox. Stem round or obtusely angular, clothed with short, spreading, and accumbent hairs; prickles irregularly scattered, small, but strong and sharp; petioles hairy; leaves quinate, very large, hairy above, densely pubescent beneath; basal leaflets subsessile, and slightly overlapping, central one cordate-ovate, dilated, and often lobed, cuspidate, dentate-apiculate; rachis hairy; panicle very broad, diffuse, hairy, and setose; flowers on long setose pedicels; sepals broad, woolly, and setose, loosely investing the fruit. In hedges, rare.

This is a luxuriantly-developed bramble, distinguished by its very large pubescent foliage, pale, but not white, beneath; diffused, branched panicle; and broad, woolly, setose calyces, loosely investing the fruit. If really a state of *R. Salteri*, it is another instance of the manner in which varieties sport into a monstrous appearance from their normal forms, as shown in the common state of *amplificatus*, with respect to *R. Schlechtendahlii*, and several others. In this, and many gigantic Rubi, I have noticed that the stem often remains suberect instead of arching, and, in this case, thickens at the top, becoming very hairy there, and surrounded with a mass of dense, small prickles. From the thickened part several other barren shoots branch off, or the secondary shoots thicken in their turn, producing tertiary shoots; till the whole mass bends in some degree, or gets supported, the main stem still remaining upright. From these suberect stems, luxuriant flowering shoots proceed, often with monstrous, very compound panicles. *R. Balfourianus* has been but rarely observed. My friend the Rev. Andrew Bloxam gathered it near Rugby, Warwickshire. I

have myself noticed some quantity of it in a lane leading from Castle Bar, near Ealing, to Twyford, Middlesex.

Subdiv. ii. RUBI GLANDULOSI.

R. Guntheri, Weihe, β . *thyrsiflorus*. Stem angular, sulcate, with small unequal prickles, and many setæ, and pale aciculi; leaves quinate, hairy; panicle very long, flexuose, with distant, axillary, racemose, somewhat spreading branches, the upper ones densely crowded, and overtopping the central flower; peduncles and calyces weakly armed, but covered with spreading hairs, extending beyond the very numerous setæ. In upland thickets, rare. Between Ilfracombe and Hele, Devonshire. Monmouthshire, *Mr. Babington*.

This thyrsifloral variety of *R. Guntheri* is a magnificent bramble, and seems of rare occurrence in this country. It has a very rough appearance, and, with its spreading, clustered branches, presents a striking difference to the pyramidal form of *R. Menkii*, though its panicle is equally long. I described this variety as *R. thyrsiflorus* in Steele's 'Handbook' (1847), but am now convinced it belongs to *R. Guntheri*. The latter, though local, has an extensive range, as I have gathered it in Devon, and received it from Hebden Bridge, Yorkshire. It is found, also, in Leicestershire, Warwickshire, and Worcestershire. Herts, *Rev. W. H. Coleman*.

R. Menkii, W. & N. Stem prostrate, angular, closely covered with few, spreading hairs, many setæ, and short aciculi; the prickles distant, slender, unequal; leaves mostly ternate, with scattered, accumbent hairs above, paler, with ciliated ribs, beneath; the central leaflet obovate, acuminate, sharply serrate; rachis densely hairy, concealing the aciculi and setæ; panicle racemose, leafy, gray with weak, entangled hairs, among which are numerous purple setæ, and a few weak, deflexed prickles; the lower axillary branches distant, rising almost parallel with the stem, upper ones crowded, spreading, single-flowered; peduncles and bracts covered with long hairs, setæ, and weak prickles; sepals excessively hairy and setose, patent in flower, and investing the half-ripe fruit.

β . *pyramidalis* (*R. pyramidalis*, *Bab.*). Panicle very long, leafy almost to the summit; the lower axillary branches so elongated as to be mixed up with those above them, and all in close conjunction with the main stem, and parallel with it.

This species seems hitherto to have been misunderstood, and consequently unnoted; but it is undoubtedly connected, by intermediate links, with *Mr. Babington's* "*pyramidalis*," as I have observed both

in Wales and Worcestershire. The name of the German botanists must therefore take precedence. *R. Menkii* appears to be almost peculiar to forest districts, where the barren stem is mostly prostrate upon the ground. If it thus remains concealed in the shade, the panicles of the next year are short, displayed in a fastigate manner, and of a very cinereous aspect; but, when more exposed, the panicle is long and racemose, exactly as represented in Rub. Germ. t. xxii. The leaves, though generally ternate, are sometimes quinate; but, in that case, the basal pair are of small size, and seated on the stalks of the intermediate. From the edges of the leaflets being decurved, they appear almost plane and even, though, in reality, sharply serrate. The barren stem, when exposed, is finely tinged with purple, and the prickles numerous, unequal, but weak and slender, straight or slightly declining, and of an intensely bright purple colour. The calyces are very hairy; when exposed, beautifully covered with purple prickles and setæ, and, before expanding, rosaceous, with leafy points. They are involute upon the half-ripe fruit, but at length loosely reflex. The variety agrees in all respects with the type, but has a remarkably elongated, pyramidal panicle, whose long-stalked branches, almost parallel with the stem, and purple-cinereous aspect, distinguish it from every other bramble.

In subalpine woods and moist thickets, but rather uncommon. Banks of the Lyn, near Brendon, Devon. Shrawley Wood and Wyre Forest, Worcestershire. Capel Curig, Caernarvonshire. The var. *β*. with the type, and also at Llanberis, Caernarvonshire. Also at Culbone, Somerset, *Mr. Babington*.

R. Babingtonii, Bell-Salt. Stem angular, sulcate; prickles small, compressed; aciculi many; setæ few, scattered; leaves ternate or quinate, large, pilose beneath, their leaflets coarsely dentate, terminal one broad, obovate, abruptly cuspidate; rachis setose, not tomentose; panicle long, leafy, setose, with slender prickles; branches short, ascending, crowded at the summit; sepals hairy, setose, acuminate, patent in flower.

β. Bloxamii (Lees). Stem sulcate, with numerous setæ and aciculi; leaves quinate, soft, and green, hairy on both sides; rachis very hairy and setose; panicle very long; the lower branches distant, paniculate, leafy to the suddenly crowded, short, bracteated upper ones; the peduncles densely hairy and setose, closely armed with long pale prickles. Borders of woods.

The variety with which I am best acquainted is a very savage-looking bramble, more prickly than the type; and on the barren stem

the setæ, aciculi, and prickles pass insensibly into each other. The rachis is covered with long hairs, almost concealing the setæ and aciculi, and densely armed with long pale prickles. Panicle, in full luxuriance, two or three feet long, with very distant, axillary, paniculate branches, at first ascending at a very acute angle; the ternate floral leaves rising nearly to the summit; upper branches densely crowded together, with trifid bracts, amidst a confused mass of hairs, aciculi, and long pale prickles; sepals foliaceous, covered with long white hairs and setæ, finally reflex. The very distant lower corymbose branches of the panicle in Bloxamii, and its far more rigid, thorny aspect, distinguish this from the thyrsiflorus form of *R. Guntheri*. On the borders of woods, but rare. The type in Hants, Leicestershire, Herefordshire, and Caernarvonshire; β . in Middlesex, Warwickshire, Leicestershire, and Staffordshire.

R. hirtus, W. & N., var. *horridus*. Hairs on the panicle so long as to be both spreading and accumbent, exceeding the setæ and aciculi in length, forming dense masses at the origin of the axillary branches; sepals armed with long, white, slender prickles, rising beyond the crowded hairs and setæ, ending in foliaceous points. Forest districts.

I must here remark that the common form of "*hirtus*," as named in English herbaria, and distributed in Leighton's 'Fasciculus,' is very unlike the figure of *hirtus* in Rub. Germ. xliii., more approximating, in the appearance of its barren stem, to *rosaceus*, t. xxxvi.; while the variety I have indicated quite agrees with the armature of the panicle in that figure, and even with its rosaceous, leafy calyces.

R. scaber, Weihe., β . *verrucosus*. Stem densely armed with yellow prickles, whose bases are distended into each other, stiff with hairs and innumerable setæ; panicle with numerous axillary branches, nutant in fruit; peduncles and sepals densely hairy and setose, crowded with acute, falcate prickles. Subalpine thickets. Bromsgrove Lickey, Worcestershire.

This variety is more closely and densely armed than any other British bramble I have met with, the enormously-distended bases of the prickles having setæ even upon them, and the entire panicle excessively thorny. *R. scaber* itself is confined to exposed, hilly spots, as Horsenton Hill, Middlesex; the Old Storage Hill, Leigh Sinton, Herefordshire; Sutton Park, Warwickshire; and in Leicestershire. I observed it, a few years since, in some abundance near Aber, Caernarvonshire. Its red, very prickly stem will always distinguish it.

R. humifusus, W. & N. Stem procumbent, sulcate, covered with numerous, but very slender and elongated, setæ, aciculi, and prickles; leaves ternate or quinate, glaucous, but closely pubescent, beneath; leaflets obovate, acuminate, sharply serrate; panicle narrow, with short, axillary, lower branches, densely crowded at the summit, very hairy and setose, armed with excessively slender prickles; sepals elongated, densely setose and hairy, closely armed with slender prickles. In thick woods, rare. Hartshill, Warwickshire; and in the forest of Dean, Gloucestershire. Near Caernarvon, and in Baron-hill Woods, Anglesea.

A prostrate bramble, the flowering stems rising from the ground, with a foliose aspect, and glaucous-green colour. The prickles, both of the stem and panicle, are long and sharp, slender as needles, and quite peculiar. This is referred as var. *foliosus* to *hirtus*, by Mr. Babington; but I here coincide with Dr. Bell-Salter.

R. mucronatus, Blox. Stem obtusely angular, slightly hairy, with a few scattered, inconspicuous setæ, and few, distant, straight prickles; leaves ternate and quinate, large, thin, and green on both sides, hairy on the veins beneath; central leaflet broadly obovate, abruptly cuspidate; panicle lax, wavy, leafy below, spreading towards the summit, covered with long hairs and pale, weak, setæ; the uppermost flowers on long, hairy, setose peduncles, armed with very long weak prickles. Shady thickets, rare. Twycross, Leicestershire; Hartshill, Warwickshire; also in Shropshire, according to Leighton's 'Fasciculus.'

This is one of those anomalous forms that it is difficult to place correctly without some study and observation. Mr. Leighton has distributed it, in his Fascic. of Rubi, as "*R. sylvaticus*;" and Mr. Bloxam, in his account of the Leicestershire Rubi, considers it a *hairy* bramble, with the above name. My observant friend, however, sent it to me originally as *R. lingua*, W. & N.; and I described it under that appellation in Steele's 'Handbook' (1847). It appears to me to be clearly a *glandular* bramble, green, weak, and attenuated, from growing in the shade. Its upper single flowers, rising above the central one, on hairy pedicels, covered with long pale setæ, and still more elongated needle-like prickles, give it often a remarkable appearance; but, when less developed, the panicle is flexuose and racemose, as in *R. Guntheri*. The setose sepals become inflex about the half-ripe fruit, but are finally loosely reflex. In this last particular, they agree with *R. Menkii* as well as in the *ashy tomentum*, mentioned by Mr. Bloxam as clothing the rachis.

Subdiv. iii. RUBI VILLOSI.

R. calvatus, Blox. Stem angular, sulcate, with few, spreading hairs (quite denuded in the upper part); prickles many, declining, irregularly scattered; leaves quinate, with hairy petioles; green on both sides, almost bald, the ribs and veins beneath only inconspicuously ciliated; leaflets all stalked, the basal pair retrose, terminal one ovate, cordate at the base, sharply and deeply apiculate, dentate, acuminate; rachis deeply ribbed, clothed with stiff, spreading hairs; panicle long, flexuous, with many corymbose branches, gradually shortening and leafy nearly to the summit; peduncles densely hairy, closely armed with long pale prickles; sepals tomentose, loosely reflexed. In exposed thickets, but not very general. Near Twycross, Leicestershire; and found by the Rev. Andrew Bloxam in several parts of that county, and in Warwickshire. Precisely similar specimens the late Mr. R. E. Wilson sent me from Cheshire. Also near Ilfracombe, Devonshire.

A large, remarkably savage-looking and strong bramble, whose stem becomes quite denuded; and the leaves are singularly bare, a few scattered hairs only being scarcely discernible on the veins and ribs beneath. The central leaflet is often exactly ovate, and very regularly, but deeply, apiculate-dentate, gradually acuminate; panicle very long, with rough, hairy, and closely prickly branches, leafy throughout, and frequently widely divaricated at the summit. This was formerly confounded with *R. villicaulis*, W. & N.; but the latter has its barren stem densely covered with white hairs, its leaves tomentose, and the branches of its panicle mostly ultra-axillary. It is not uncommon in woody spots. Plentiful in Caernarvonshire, and southward to Dorsetshire.

Subdiv. iv. RUBI PHLOSI.

R. Sprengelii, W. & N. Stem prostrate, round, clothed with long spreading hairs; prickles small, weak, hooked or deflexed, and dispersed unequally on all sides; leaves mostly ternate, thin, smooth above and beneath; leaflets elliptical, central one obovate, sharply serrate, acuminate, with prominent veins beneath; panicle slender, with crowded, divaricate, leafy branches; the peduncles closely covered with attenuated, tortuous hairs, concealing both setæ and prickles; petals small, obtuse, and rugose. In thick woods, rather local. I have gathered it in Buckinghamshire, Devonshire, Gloucestershire (forest of Dean), Leicestershire, Warwickshire, and

on Bromsgrove Lickey, Worcestershire. Also by the side of Llyn Cwellyn, and near Capel Curig, Caernarvonshire. Mr. Samuel Gibson sent it me from Hebden Bridge, Yorkshire, unnamed, nearly ten years since; and Mr. S. E. Wilson, from Cheshire.

Perhaps the most beautiful of the British Rubi, delighting in shady upland woods, often among the *Vaccinium Myrtillus*, where the barren stem trails upon the ground, throwing up numerous alternate flowering shoots, densely covered with weak, but long and spreading, white hairs; yet the plant is scarcely evident to the view until the small, but very deep red, flowers are unfolded. The prickles are always small, not quite uniform in size, pale yellow, and often very uncinatè. The panicle is very hairy, with distant, leafy, cymose branches below, single-flowered, with narrow, leafy bracts, above; peduncles clothed with long extending hairs, partly spreading, partly accumbent, and entangled among which are a few slender, pale prickles. Sometimes the panicle is excessively complicated, the branches themselves becoming doubly cymose, and the central flower overtopped. The sepals are elongated, densely hairy, partially investing the half-ripe fruit, but at length loosely reflex; petals small, rugose, bright red, or, more rarely, white; fruit small, of few drupes, deep purplish black.

β. Borreri (R. Borreri, *Bell-Salt*.). Stem stouter, with larger and more unequal prickles, and a few setæ and aciculi. Leaves generally quinate; panicle corymbose, prickly; the widely spreading branches with setæ far overtopped by the wavy hairs. Growing in more exposed places than the type, and so forming taller and more luxuriant bushes; but intermediate connecting forms occur. Warwickshire, Cheshire, &c. I observed it very fine, a few years since, at Burnham Beeches, Buckinghamshire.

R. macrophyllus, W. & N. In mentioning this species in a general account of Rubi, I would still further indicate its distinctness from my *R. amplificatus*, with which it is so generally confounded. The latter common form is certainly not the German plant of *Rub. Germ.* t. xii., the one now in review, and which I believe to be the real plant of the Sussex forests, where I have studied it. *R. macrophyllus* has its barren stem very thick, yet pithy, not ligneous, deeply sulcate, and surrounded with a fringe of patent hairs; the prickles very distant, few, and exceedingly small in proportion to the size of the shrub. The stem, in moist places, extends widely, and arches, but grows in a suberect manner when confined. In the latter case, it is often densely hairy; while, when more exposed, there is merely a fringe of

patent hairs. The leaves are ternate, as well as quinate, but mostly the latter, not always very large; but the leaflets have a *peculiar white tomentum beneath*,* that distinguishes them from *R. amplificatus*; the intermediate and terminal leaflets being nearly of the same size, but with a wavy, irregular outline, and very coarse serratures. The large panicle appears often almost unarmed; and, if the branches are short, the floral leaves rise far above them; but in full luxuriance it is long, with wide-spreading, leafy branches, densely hairy, and with numerous pale, weak prickles; glands being often concealed amidst the spreading hairs. The lower axillary branches have large, ternate floral leaves (also with a pallid silvery aspect beneath), which are much reduced in size upon the ascending ones; so that near the summit of the panicle they are quite lanceolate; but the uppermost branches are naked. Calyces reflex in flower and fruit, their sepals densely hairy, sometimes prickly; the fruit round, very small, of few drupes, and of an intensely polished black. In woods and forest thickets, rare. Chiefly in the South of England. St. Leonard's Forest, Sussex; and at "The Shorden," a wood near Hastings. Near Ilfracombe, Devon; and in Cowleigh Park, near Cradley, Herefordshire. Also in Glamorganshire, and by the lower Llanberis Lake, Caernarvonshire. (The specimen distributed in Leighton's Fascic. of Rubi as "*R. macrophyllus*" is only *R. amplificatus*).

Subdiv. v. RUBI CANDICANTES.

R. thyrsoideus, Wimm. Stem sulcate, almost glabrous, with very few fascicled hairs; prickles numerous, strong; leaves quinate, smooth above, silvery pubescent beneath; the leaflets all stalked, middle and basal elliptical, central one oblong, all very sharply serrate, cuspidate; panicle long, thyrsoideus, with numerous axillary branches, distant below, gradually shorter and very crowded at the summit; peduncles shaggy with hairs, armed with falcate prickles; calyces tomentose, tawny, loosely reflex in fruit. Hedges and thickets, but not common.

β. macroacanthus. Stem and petioles densely armed with falcate prickles; rachis covered with stiff hairs; panicle pyramidal, with numerous, many-flowered, corymbose branches, gradually shortening to the summit; peduncles, calyces, and under side of leaves white, with a thick investiture of stiff white hairs.

* "Foliola," observe W. & N., in their detailed description of *R. macrophyllus*, "in latere superiori saturate viridia parum pilosa, in latere inferiori sub-tomentosa, pallide viridia, coriacea."—*Rub. Germ.* p. 35.

The plants of this section are all closely related to each other; and some states of *macroacanthus* are, with difficulty, distinguishable from *R. vestitus*.

Subdiv. vi. RUBI NITIDI.

R. cordifolius, W. & N. (and *R. rhamnifolius*). This very common, and generally well-marked bramble, has its leaves extremely variable, both in size and outline; but frequently they are exactly heart-shaped; and therefore I think the name *cordifolius* is to be preferred. The central leaflet, in woods, is often thrown out on a singularly elongated foot-stalk; but this is a mere sport of growth: and occasionally the leaflets are cut up into lacinated, pinnatifid segments. I can see no essential distinction in Mr. Hort's *R. imbricatus*, described in the third edition of Babington's Manual, as intermediate forms occur; nor can a species be well founded merely upon the disposition of the leaflets. I noticed, in Steele's 'Handbook,' var. *β. blanditus*, which is the thyrsifloral form of this species, with long leafy panicle, and leaves very large and velvety beneath. There is also a wood form, which may be termed *olivaceus*, from its dull olive-green aspect. This is more prickly than the type, the leaflets closer together, somewhat imbricate, obovate and acuminate, with a narrower and more prickly panicle.

R. affinis, W. & N., *β. patentissimus*. Panicle with wide-spreading, compound, naked branches; leaflets obovate or ovate-oblong, with long, curved cusps, beneath strongly ribbed and pubescent. In woods.

This bramble, long misunderstood, proves to be widely dispersed in its typical form, and affects exposed heaths, where it forms stunted bushes, with a suberect habit. I have observed it in great plenty in Cardigan and Caernarvon shires; and probably few counties are without it. In woods, it grows taller, with long and often widely-distended panicles; but the fruit is then mostly abortive.

R. lentiginosus, Lees. Stem suberect, clothed with rather distant, patent hairs, and numerous sessile glands (in age denuded), armed on all sides with sharp, straight, slightly unequal prickles; petioles hairy, with many falcate prickles; leaves quinate; the basal leaflets sessile and retrorse, intermediate elliptical, central one ovate, all inciso-serrate, acuminate, smooth above, hairy on the ribs beneath; panicle long, racemose, with short axillary branches, hairy and very prickly, with inconspicuous glands, leafy nearly to the summit; bracts hairy and slightly glandular; sepals densely hairy and prickly, with

interspersed glands, involute on the half-ripe fruit ; petals small, crumpled, not exceeding the calyx in length. Subalpine woods. On the woody ascent at the back of the hotel at Capel Curig. On the side of the ravine below Conant Mawr, Caernarvonshire.

This is a very prickly bramble, with a suberect habit, the stem sometimes marked with blotches ; and its nearest relationship appears to be with *R. affinis* ; but its elliptical, sharply-cut leaflets, and racemose panicle, give it a very different appearance to either that or the suberect *Rubi* ; and it is rather comparable to *R. Guntheri*, among the glandular group. The flowers are in general small, and the whole plant weak ; yet the stem is so prickly, and the points of the prickles so sharp and attenuated, that it is one of the most lacerating among the whole tribe. It seems attached to subalpine spots, where only I have found it, and does not fruit well, except on moist ground.

The stem appears to be constantly suberect, but bent to the ground with the flowering shoots, which mostly rise up in a fastigate manner ; leaves sometimes septenate ; the rachis is clothed with spreading hairs ; the panicle flexuose, variable in length, in full luxuriance long, with many alternating axillary racemes of small flowers ; floral leaves ternate ; the uppermost branches clustered, single-flowered, naked ; peduncles and bracts covered with long spreading hairs, with a few glands on the latter ; calyces closely hairy and prickly, with glands hidden in the pubescence ; the sepals patent in flower, and until the fruit is half ripe, then becoming loosely reflex ; petals very small, crumpled, inflex, scarcely exceeding the sepals in length ; stamina and styles pale green ; fruit, in a half-ripe state, a brilliant red, but finally intensely-polished black, oblong and irregular, of many drupes. Ripe in September.

Subdiv. vii. RUBI SUBERECTI.

R. suberectus, And. Stem angular, polished, smooth ; prickles distant, straight ; leaves ternate, quinate, or septenate, flexible, with prominent veins beneath ; central leaflet cordate, acuminate, often very elongate ; panicle almost simple (when the stem trails on the ground), or long, with leafy, corymbose branches ; the upper flowers erect, on hairy pedicels, overtopping the central one ; sepals hairy, patent about the half-ripe fruit. Subalpine woods and boggy heaths.

β. fissus (*R. fissus*, *Lind.*). Prickles numerous, very slender ; leaves more hairy ; basal leaflets sessile, or united with the intermediate, central one divided at the base ; panicle short, crowded.

γ. umbrosus. Stem firm and lofty ; leaves very large ; the central

leaflet broadly cordate, excessively elongated at the point; panicle short, with single flowers, and large floral leaves.

Except as regards the barren stem never rooting at its extremity, *R. suberectus*, according to situation or exposure, is a very variable plant. It only attains perfection in moist, shady places; and where moisture is wanting, though at first erect, the weak, barren shoot trails upon the ground, or rests upon the low underwood, producing numerous, but short, fastigate bunches of flowers from the axils of the old leaves. This is a form of growth, but can hardly be distinguished as a variety, and is represented in *Rub. Germ. t. 2*. When the stem preserves its erect form the second year, the panicle is moderately long, with leafy, corymbose branches, below more or less hairy, almost unarmed; the uppermost flowers single, alternate, on long bracteated pedicels, overtopping the central flower. It is remarkable that, in their progress towards fruiting, the upper flowers spread out in an horizontal direction; so that when the fruit is mature they present a far more fascicled aspect than they did originally. Conspicuous, trifid, hairy bracts occur at their bases, becoming simple at the summit; the calyces are hairy, patent even in fruit, seldom more than semireflex; petals white or pink, of a pretty appearance when fully expanded; the fruit is rather small, its drupes few, and often presenting only dry, hard achenes, when half ripe of a bright red colour, but, when succulent, mulberry-coloured, or at length raven-black.

It is only in the woods near the waterfalls of Wales, or on the moist, bushy hills of Devonshire, that this species attains its perfection of beauty, growing perfectly erect, producing conspicuous flowers, and, in the var. *umbrosus*, becoming an ornamental shrub, from six to eight feet high. The leaves are frequently very large, bright green, and of a soft, silky appearance; but the fruit is seldom succulent but in moist, shady localities, and has but little flavour.

Though generally accounted rare, this species has a wide range, and, though perhaps more abundant in the North, grows finer and most luxuriant in the South of England. Don mentions it as growing on the banks of Loch Ness, Scotland, and as a native of the Highlands of Aberdeen and Perthshire, and the hills of Forfarshire. I have gathered it in Devonshire, Somersetshire, Buckinghamshire, Gloucester, Leicester, Warwick, and Worcester. I have also received it from the Lake district, Yorkshire, and Cheshire. It is most abundant in North Wales, particularly in Caernarvon, Montgomery, and

Merioneth shires ; and I have gathered it, also, in Brecon, Cardigan, Pembroke, Caermarthen, and Glamorgan shires.

R. plicatus is equally extended with *R. suberectus*, and is a stronger and stouter plant, with larger prickles. It is less commonly found prostrate, but is occasionally forced to the ground, beneath the weight of its flowering branches. I have observed it very fine on the Island of Llandysilio, in the Menai Strait.

Subdiv. viii. RUBI IDÆI.

R. Leesii, Bab. Stem round, bending, closely, but minutely, tomentose ; prickles numerous, slender, straight, rising suddenly from a bulbous base ; leaves all ternate ; the leaflets subsessile, roundly ovate, the basal ones overlapping, minutely hairy above, white, with accumbent pubescence beneath ; flowering branches axillary, alternate to the end of the stem, downy, with trilobated or cordate, deeply-cut floral-leaves ; flowers in numerous clusters ; the peduncles armed with setaceous prickles. In stony, subalpine woods, rare. Ilford Bridges, near Brendon, Devon. Dunster, Somerset, on the way to Timberscombe.

Stem scarcely a yard in height, producing terminal as well as axillary flowers, in dense clusters, and well characterized by the singular, trilobated, widely-distended floral leaves, which are frequently so united as to be cordate, and deeply indented. The petals are often multiplied in number to twelve or sixteen, which is probably the reason the plant seldom fruits. I have only once met with it in that state, when the fruit was very small, and bright crimson.

I sent sterile specimens to the London Botanical Society nine years ago, under the name of *Fragaria-similis* ; many of the leaves having much the appearance of those of the common strawberry. It has since been gathered at Dunster, by the Rev. W. H. Coleman and Mr. Babington. It is likely to be met with in Wales and the Lake district.

To give a full and correct account of the distribution of the Rubi in Britain, would require an extended observation of many years ; * and though I have attended much to the subject, I know but little of the Rubi of the North of England, from actual observation. A lover

* Mr. Babington has a valuable paper on the subject, in the third volume of Mr. Watson's 'Cybele' ; but I could much extend the range there given for many species.

of temperate regions, the bramble does not, in this country, rise very high on the mountains, and is most luxuriant in the valleys, especially in the vicinity of moisture; though *R. discolor* will flourish in the driest spot. The loftiest place on which I have found a bramble growing is on the tabular summit of the Banwen Mountain, Breconshire, about 1800 feet in altitude, where I have gathered *R. suberectus* in a stunted state, yet with large, disproportionate flowers, very similar to specimens I have from the "Highlands of Scotland," presented me, some years since, by Mr. H. C. Watson, but with no mention of altitude. Perhaps in Scotland, *R. suberectus*, in springy spots upon the mountains, may ascend higher than in Wales. The highest spot where I have noticed *R. cæsius* is on the table-land of the Cotteswolds, near Birdleap, Gloucestershire, which is between 1000 and 1100 feet high. Next to *R. suberectus*, the pretty *R. Sprengelii* seems most to affect subalpine spots: it occurs on the summit of the Lickey Beacon, Worcestershire, among bilberries, at 950 feet; on Bardon Hill, Leicestershire, at 800 feet; and between Capel Curig and Llanrwst, North Wales, which must be considerably higher. *R. Bellardi*, also, I have noticed, on a wooded hill near Malvern, at full 800 feet; and many of the Rubi that occur about waterfalls in Wales, as *R. Menkii*, *R. scaber*, *R. incurvatus*, *R. affinis*, &c., must be seated at full 1000 feet; but brambles are never found, with the *Ulex*, occupying the summit of mountains. Indeed, it is in the southern counties where they attain the greatest luxuriance of growth, especially in Devonshire, where *R. macrophyllus*, *R. plicatus*, and *R. suberectus* grow very lofty, with magnificent foliage, and *R. Guntheri* is dilated into the thyrsifloral form.

The bramble tribe flourish, on the coast, to the very margin of the sea. Extensive sandy tracts in Merioneth and Caernarvonshire are covered with the trailing *R. cæsius*; and my friend the Rev. J. H. Thompson has observed the same in Lincolnshire. Probably the coast of every English county where there are sandy denes possesses the cæasian bramble in like manner. *R. discolor*, also, extends to the tidal boundary, and where I have seen it on the shores of North and South Wales, and in Devon and Somerset, must often be bathed in the saline spray.

R. cæsius, *corylifolius*, and *discolor* appear to be very generally dispersed; but the latter becomes less common in the north of England. The glandulose brambles have some form to represent them almost everywhere in the low country, of which *R. rudis* and *Kœhleri*

are the most certain and characteristic. *R. hirtus* and *R. pallidus*, though equally common, are confined to woods. *R. Bellardi* and *Lejeunii* ("glandulosus," *Bab.*) are local species, yet widely dispersed from Yorkshire to Middlesex. They occur in several places in the intermediate counties, as Leicester, Hereford, Worcester, and Bucks. I have also gathered *R. Bellardi* near Dolgelley, Merionethshire. The very prickly *R. scaber* affects hilly woods, as Horsenton Hill, near Harrow, Middlesex, and Bromsgrove Lickey, Worcestershire. It also forms thickets about the bases of the mountains in Caernarvonshire.

R. carpinifolius and *cordifolius* are of general occurrence; and scarcely any wood is devoid of *R. amplificatus*; but what I conceive to be the true *R. macrophyllus*, *W. & N.*, is rare, except in the south of England. *R. villicaulis* abounds in North Wales, but is by no means a general hedge-bramble; and *R. vestitus* is universally diffused in woods, becoming excessively villose in the shade. *R. Lindleianus* (*R. nitidus*, *Bell-Salt.*) is a common form, particularly abundant in North Wales and Anglesea; nor is *R. affinis* much less diffused, as I have either gathered or received it from various counties, from Westmoreland to Dorset.

In Wales, a microphyllous form of *R. Idæus* is prevalent in subalpine spots; but though the foliage of this is often ternate, the leaflets are never ovate and overlapping, as in the very local *R. Leesii*. The common state of *R. Idæus*, from its stoloniferous growth, is almost everywhere widely spread, and continually extending itself.

R. saxatilis is well known as a northern herbaceous species; but I have gathered it as far south as Watersmeet, on the banks of the Lyn, Devonshire. It occurs, also, in Wire Forest, Salop, and Worcester; and is quite abundant among the stony recesses of the woods of the Cotteswolds, Gloucestershire.

EDWIN LEES.

Cedar Terrace, Henwick, Worcester,
March 9, 1853.

Remarks on Plants sent to the Botanical Society of London in 1852.

By J. T. SYME, Esq.*

As the additions to the British Flora in 1852 have been but few, my report on the plants sent to the Botanical Society of London will be short, although the number of specimens received has been very large. Most of these, of course, require no explanation; and there are only a few varieties and doubtful species which seem to call for special notice. These will be sent out as usual, as far as the supply will admit of, and include the following:—

1. *Thalictrum pubescens*, Schl. A pubescent variety of *T. minus*, from Redcar. Communicated by Mr. J. G. Baker.

2. *Ranunculus aquatilis*, L., var. ? I send this, as it is sometimes mistaken for *R. fluitans*, which it somewhat resembles in the elongated stems, destitute of floating leaves; rounded carpels; and many-veined petals. The specimens are from the side of the Thames, near Putney.

3. *Ranunculus confusus*, Gr. & G. Mr. Baker sends what seems to be a very slender form of this plant, with the leaves, flowers, and carpels less than half the usual size.

4. *Barbarea vulgaris*, Br. Variety with spreading pods. Sent as it might be confounded with *B. arcuata*.

5. *Nasturtium officinale*, Br., var. *Siifolium*, Rchb. A very luxuriant state of *N. officinale*, from Haddingtonshire.

6. *Melilotus parviflora*, Lam. Abundant on rubbish on a new quay at Wandsworth, with many other aliens.

7. *Epilobium Lamyi*, F. Schultz. Mr. T. Moore sends the plant, found by him near Sandwich, which was so named by Mr. Babington. Mr. Purchas sends the same form from Herefordshire, under the name of *E. virgatum*, Fr. This name, however, I think, belongs to another plant, of which I distribute a few examples from Scotland.

8. *Montia rivularis*, Gmel. A large form of *M. fontana*, L., considered as a distinct species by some continental botanists.

9. *Hieracium cæsum*, Fr. From Yorkshire (Mr. Baker). Probably some members may have this in their herbaria under the name of *H. murorum*, which seems to be a more uncommon plant in Britain.

10. *Carduus acaulis*, L. Var. with a distinct stem. The examples are from Kent and the Isle of Wight.

* Read before the Botanical Society of London, April 1, 1853.

11. *Chenopodium rubrum*, L., var. Resembles *C. botryoides* by its prostrate stem and entire leaves. The seeds are larger than in the ordinary form. Gathered by the side of the Thames, below Gravesend.

12. *Narcissus incomparabilis*, Curt. Killyington, Yorkshire, where it was found by Mr. Baker; quite naturalized.

13. *Glyceria hybrida*, Tourn. A variety of *G. plicata*, so labelled by Mr. Baker.

14. *Bromus secalinus*, L., var. A very puzzling form, from Hook, Surrey, sent by Mr. Watson. It is intermediate between *B. secalinus* and *B. commutatus*. I should have rather labelled it as the latter.

15. *Bromus patulus*, M. & K.? From Middlesbro', Durham (Mr. Baker). Very like *B. arvensis*; but I have not altered the name, as I have never seen *B. patulus*; and this plant has some of the characters assigned to that species.

Mr. Watson sends *Hieracium gothicum*, Fr., from Surrey; and Mr. Baker, *H. tridentatum*, Fr., from Yorkshire. These two plants certainly belong to the same species, as Mr. Watson pointed out to me. Mr. Atkins also sends it from Kent, under the name of *H. sylvaticum*.

Poa polynoda, Parn., has been sent by several members, under the name of *P. compressa*, from which I have great difficulty in distinguishing it, even as a variety.

Of *Triticum laxum*, Fr., there is a large supply, from Mr. T. Moore and myself. Some of my specimens I am at a loss whether to label as *T. laxum*, or *T. repens*, *β. littorale*.

Thalictrum flexuosum, Fr. Specimens of what I suppose to be this plant have been received from the Rev. T. Butler and Mr. Whittaker. The former sends it from Snowdon; the latter, from Disseth, Flint.

Mr. Whittaker also contributes a number of specimens of *Thlaspi virens*, Jord., from Matlock. Since my last report, I have received specimens of this plant from Lyons, named by Mr. Jordan. These agree pretty well with the Derbyshire plant in the shape of the pouch, and length of the style, but have the fruiting raceme shorter, and the flowers nearly twice as large.

I am glad to notice considerable improvement in the selection of specimens sent to the Society, and hope that before long the practice of sending useless scraps may be given up altogether. The grasses, Cyperaceæ, Orchidæ, and bulbous Monocotyledons suffer most from the habit of sending examples without roots; and roots are of the

greatest importance in these very orders. In the two first orders, indeed, specimens should always show whether the plant has a creeping or a tufted root; yet some of these, which are beautifully pressed, are quite useless, from being without roots, and some even without leaves. I hope, however, that this may be remedied, by destroying all the imperfect specimens, except in the case of very scarce plants.

J. T. SYME.

London, April, 1853.

NOTICES OF NEW BOOKS, &c.

'A Catalogue of the Flowering Plants and Ferns growing in the Neighbourhood of Aberdeen. By P. H. MACGILLIVRAY, A.M.
Aberdeen: Wilson. London: Whittaker. 1853.

ALL local Floras are acceptable to the botanist, in proportion to the information they convey. Thus, a simple list of names is of infinitely less service than when each name is accompanied by some account of the circumstances under which the species to which it refers is found. In this respect, we think the information afforded by the present Flora is rather scanty. We could have willingly dispensed with some of the information given, and should have been pleased to have received other information which is withheld. Thus, we are informed that *Ranunculus aquatilis* occurs in "ponds, ditches, and rivers," and *R. hederaceus* in "ditches." We doubt not these assertions; but we should have liked some additional information on the supposed new and kindred species, all notice of which is omitted. Again, in the ferns, we scarcely feel satisfied with the old-fashioned mode of lumping species. However, in this and all similar cases, we think the more courteous way is to give the author's own "envoi;" and here is Mr. Macgillivray's

"Preface.—The only published accounts we have of the botanical productions of the neighbourhood of Aberdeen are contained in Dr. Murray's '*Northern Flora*,' of which, however, owing to the untimely death of its talented author, but one part made its appearance; and in a small work by Dr. Dickie, giving a list of the Flowering Plants and Ferns found within fifteen miles of Aberdeen. So many years

have elapsed since the publication of Dr. Dickie's list that a very considerable number of species and localities have been added, but many doubtless still remain to reward the zeal of future collectors.

"The boundaries I have chosen are, to the north, the estuary of the Ythan; to the south, Garron Point in Kincardineshire, about twelve miles from Aberdeen; and to the west, the village of Banchory Ternan, eighteen miles from the same place. In this tract of country we have almost every diversity of soil and situation, from maritime downs and cliffs to elevated upland moors. The coast to the south of Aberdeen presents an extensive range of low rocky precipices, plentifully interspersed with coves and bays, with pebbly beaches, marshes, and grassy sea-banks; while to the north extends a bare sandy beach, lined by a narrow belt of sandy downs or links, with the estuaries of the Don and Ythan, and here and there a few small marshes. Within this, and south of the Dee* occupying a smaller space, is the usual tract of cultivated land, meadows and pastures. Further inland are extensive ranges of moory hills, and at frequent intervals scattered through the cultivated country are various moors and bogs, as well as several lakes, some of which are of large size.

"Along the sandy beach and links to the north of Aberdeen, we find the vegetation chiefly marked by the great abundance of *Ammophila arundinacea*, *Festuca rubra*, *Triticum junceum*, *Carex arenaria*, *Myosotis collina*, and *Vicia lathyroides*. Other plants occurring here are *Cakile maritima*, *Cerastium atrovirens*, *Saxifraga granulata*, *Hieracium vulgatum*, *Gentiana campestris*, *Armeria maritima*, *Plantago maritima* and *Coronopus*, *Glaux maritima*, *Salsola Kali*, *Atriplex laciniata*, *Triglochin maritimum*, *Habenaria bifolia*, *Scirpus maritimus*, *Blysmus rufus*, *Carex incurva*, *Botrychium Lunaria*, and *Equisetum variegatum*. The Kincardineshire coast, as might be expected from its rocky nature, presents some differences in its vegetation from that north of the Dee. The plants principally characterizing it are *Cochlearia officinalis*, *Silene maritima*, *Astragalus hypoglottis*, *Ligusticum Scoticum*, *Mertensia maritima*, *Juncus compressus*, *Blysmus rufus*, *Carex incurva*, *C. distans*, *C. vulpina*, and *Asplenium marinum*. Besides these, we have *Geranium sanguineum* growing in great luxuriance on rocks south from the Cove, *Vicia sylvatica*, *Erythraea linarifolia*, *Carex intermedia*, *C. extensa*, *C. muricata*, *C. hirta*, *Festuca elatior*, and *Osmunda regalis* growing on a single cliff at the Cove.

* * The river Dee, in the lower part of its course, forms the boundary between the counties of Aberdeen and Kincardine.

"The cultivated tract presents little of any interest, except that several species of common occurrence in more southern districts are here entirely wanting. These are such as *Papaver Argemone* and *Senecio viscosus*. Several others, as *Scandix Pecten*, *Stachys arvensis* and *Anagallis arvensis*, though occasionally to be met with, are of very rare occurrence.

"The hilly and moorland part of the district is distinguished by the abundance of *Drosera rotundifolia*, *Comarum palustre*, *Menyanthes trifoliata*, *Pinguicula vulgaris*, *Trientalis Europæa*, *Narthecium ossifragum*, *Eriophorum angustifolium*, *Carex binervis*, *C. flava*, *C. curta*, *C. stellulata*, *Blechnum boreale*, and *Lycopodium clavatum*. We also find, though in less abundance, *Drosera Anglica*, *Genista Anglica*, *Vaccinium Vitis-ideæ*, *Arctostaphylos Uva-ursi*, *Listera cordata*, *Schoenus nigricans*, *Lycopodium alpinum*, and *L. clavatum*. In the fir woods in this tract, as well as in those scattered through the cultivated country, *Goodyera repens* occurs in considerable abundance, and in many localities may be seen the rare and beautiful *Linnaea borealis*.

"Several alpine species are mentioned as occurring on the banks of the Dee. These, however, are not to be considered as properly belonging to our Flora, but merely as accidental stragglers washed down by the river from their proper habitats among the mountains of Braemar."

'The Annals and Magazine of Natural History,' Nos. 61, 62, 63, and 64, January, February, March, and April, 1853.

No. 61 contains one botanical article, intituled:—

'Observations on the Solanaceæ; by John Miers, Esq., F.R.S., F.L.S.' This paper is continued in No. 62.

No. 62 contains one botanical article, intituled:—

'On Relative Position; including a New Arrangement of Phanerogamous Plants. Part I. On the Position of the Raphe. By R. Clarke, F.L.S., &c.' This paper is continued in No. 63, the part therein contained (Part II.) being on the position of the carpels.

In addition, there is a translated paragraph, by G. H. Ulex, 'On the Influence of Coal Gas on Vegetation;' and another, by M. Garreau, 'On the Relations between the Oxygen consumed by the Spadix of *Arum italicum* and the Heat produced by it.'

No. 63 contains one botanical article, intitled :—

‘Observations on the Genus *Schwenkia*; by John Miers, Esq.’
Also the continuation of Mr. Clarke’s paper, and an extract from the
‘Gardener’s Chronicle,’ ‘On the Structure of the Cells of Plants.’

This is a double number, containing 102 pages, and is charged 5s.

The botanical papers in No. 64 are intitled :—

‘Remarks upon British Plants; by Charles C. Babington, M.A.,
F.R.S., F.L.S., &c.’

‘On the Germination of the Resting Spores, and on a Form of the
Moving Spores in *Spirogyra*; by Dr. W. Pringsheim.’ Translated
from the ‘Flora,’ of August, 1852.

Mr. Babington’s paper is of great interest, and has already been
noticed in these pages, in our report of the Proceedings of the Bota-
nical Society of Edinburgh. The genera of which the author treats
are *Thalictrum* and *Polygala*.

In the third edition of his ‘Manual,’ Mr. Babington gives six Brit-
ish species of *Thalictrum* :—1. *alpinum* (2. *minus*; 3. *flexuosum*; 4. *saxatile*; 5. *majus*); 6. *flavum*. In the sixth edition of the ‘Brit-
ish Flora,’ the learned authors reduce these to three; uniting, under
the name of *minus*, the four above-mentioned species which we have
included in parentheses: but this step seems rather the result of non-
acquaintance with the plants, than of a careful investigation and com-
parison of their characters; for the authors merely assert, under *T.*
minus, that “*T. saxatile*, *Kochii*, *flexuosum*, and several others, are
mere forms of this;”—a mode of dismissing a difficult subject, that
will scarcely be held satisfactory.

Mr. Babington, having recently obtained extended materials, and
being assisted by the acute judgment of Mr. Hort, whose botanical
acumen has long been familiar to the readers of the ‘Phytologist,’ has
carefully considered the entire subject, and without acceding to the
extreme views entertained by the authors of the ‘British Flora,’
candidly admits that he now believes the *T. majus* of his ‘Manual’
was “formed out of larger states of each of the others, but especially
of *T. saxatile* and *T. flexuosum*.” The other three species he still
retains, giving the subjoined characters and synonyms :—

Thalictrum.

- “1. *T. minus* (Linn.); stem zigzag striated branched solid leafless
at the base, stipules with inflexed auricles, leaves 2-3 pinnate,
leaflets ternate 3-cleft glaucous, petioles with angular ascending

branches, panicle leafless with divaricate branches, flowers drooping, carpels fusiform 8-ribbed subcompressed ventricose below externally.

"*T. minus*, Koch, *Syn.* ed. 2, 4; *Fries, Summa*, 135; *Reich. Icon. Fl. Germ.* iii. t. 27!

"*T. majus*, *Reich. l. c.* t. 30.

"2. *T. flexuosum* (Reichenb.); stem zigzag striated branched leafy to the base, stipules with reflexed auricles, leaves 2-3-pinnate, leaflets 3-5-cleft paler beneath, petioles with patent divaricate branches, panicle leafy elongated with patent often reclinate branches, flowers drooping, carpels narrowly oblong subcompressed sub-10-ribbed gibbous within upwards.

"*T. flexuosum*, 'Bernh. Cat.' ex *Reich. Fl. excurs.* 728, et *l. c.* *Fl. Germ.* iii. 14, t. 28; *Fries, Summa*, 136, et *Herb. Norm.* vii. 24!

"*T. collinum*, *Wallr. Sched.* 259, teste *Reich.*

"*T. capillare*, *Reich. Fl. excurs.* 729, et *l. c.* *Fl. Germ.* iii. 15, t. 36.

"*T. majus*, *Sm. Eng. Bot.* t. 611, et *Eng. Fl.* iii. 42.

"3. *T. saxatile* (DC.); stem rather zigzag smooth but striated below the striated sheaths branched hollow leafy to the base, 'stipules with horizontal auricles' (*Fries*), leaves 2-3-pinnate, leaflets 3-5-cleft paler beneath, petioles subterete with patent not divaricate branches, panicle leafless erect pyramidal with patent straight branches, flowers drooping (?), carpels regularly oval.

"*T. saxatile*, *DeCand. Fl. Fr.* v. 633; *Reich. l. c.* *Fl. Germ.* iii. 15, t. 34; *Gren. et Godr. Fl. Fr.* i. 7 (excl. syn.).

"*T. Kochii*, *Fries, Mant.* iii. 46, et *Summa*, 136.

"*T. collinum*, 'Wallr.' teste *Fries, Herb. Norm.* vii. 25; *Koch, Syn.* ed. 1, 4."

Polygala.

In the third edition of his 'Manual,' Mr. Babington gave two species of *Polygala* as British, under the names of *vulgaris* and *amara*. In the sixth edition of the 'British Flora,' the authors sink the second species; explaining that they are unable to separate the British plant, so called, from the first. In neither of the works is there any notice of the mass of valuable matter published on the genus, in the 'Phytologist,' from the pens of Dr. Bromfield and others. The recent

discovery of *P. uliginosa* in Scotland, by those acute botanists, the Backhouses, as recorded in a late number of the 'Phytologist,' has induced Mr. Babington to revise and amend the characters he had previously assigned to the British species, or forms, of *Polygala*. The following are the characters which Mr. B. proposes :—

"1. *P. vulgaris* (Linn.); leaves scattered, lower leaves smaller oblong, upper leaves lanceolate, wings of the calyx obovate mucronate their nerves branched the lateral looping with a branch of the central nerve, capsule obcordate, lobes of the arillus unequal, lateral bracts shorter than the pedicels.

"*P. vulgaris, auctorum.*

"*β. depressa*; lower leaves crowded and often opposite but small, stem long wiry prostrate, racemes ultimately lateral.

"*P. vulgaris*depressa, Fries, Mant. ii. 41.*

"*P. depressa, 'Wend.' ex Koch, Syn. ed. 2, 99; Coss. et Germ. Fl. Par. 56, t. 8; Bromf. in Phytol. ii. 966; Gren. et Godr. Fl. Fr. i. 196.*

"*P. serpyllacea, 'Weihe' ex Sond. Fl. Hamb. 388.*

"*γ. oxyptera*; flowers smaller, fruit broader than the wings of the calyx.

"*P. oxyptera, Reich. Iconog. i. f. 46!*

"*P. multicaulis, Tausch!*

"2. *P. calcarea* (Schultz); leaves chiefly in an irregular terminal tuft large obovate obtuse, leaves on the flower-shoot smaller lanceolate, wings of the calyx oblong their nerves branched the lateral looping with a branch from near the middle of the central nerve, capsule oblong obcordate, lobes of the arillus unequal, lateral bracts shorter than the pedicels.

"*P. calcarea, Schultz in Bot. Zeit. (1837) 752, et 'Exsic. ii. 15; Koch, Syn. ed. 2, 100; Bab. Man. 39; Gren. et Godr. Fl. Fr. i. 196!; Walp. Rep. i. 292.*

"*P. amara, Reich. Fl. excurs. 350, et Fl. exsic. 749!; Eng. Bot. t. 2764!*

"*P. amarella, Reich. Iconog. i. f. 43, 44; Coss. et Germ. Fl. Par. 56, t. 7.*

"*P. austriaca* (Crantz); leaves in a rosette obovate obtuse larger than the oblong-lanceolate ones on the flower-shoot, wings of the calyx oblong or obovate obtuse their nerves simple or slightly branched free, capsule wedge-shaped below roundish broader than the wings, lobes of the arillus nearly equal, lateral bracts shorter than the pedicels.

"[*a. genuina*; leaves of the rosette smaller than those of the branching flower-shoot, flowers smaller, capsules rounded below.

"*P. austriaca*, 'Crantz, Aust. v. 2;' Reich. Iconog. i. 23, t. 21, f. 39, et *Fl. excurs.* 350, et *Fl. exsic.* 1923 !].

"*P. uliginosa*; leaves of the rosette larger than those of the nearly constantly simple flower-shoot, flowers larger, capsules wedge-shaped.

"*P. uliginosa*, Reich. Iconog. i. 23, t. 21, f. 40, 41, et *Fl. excurs.* 350, et *Fl. exsic.* 52 !; Fries, *Summa*, 154, et *Herb. Norm.* iii. 14 !

"*P. myrtifolia*, Fries, *Nov. ed.* 2, 227; Wimm. et Grab, *Fl. Siles.* iii. 24.

"*P. amara*, *Sven. Bot.* t. 484; *Fl. Dan.* t. 1169.

"*P. austriaca*, *Coss. et Germ. Fl. Par.* 56, t. 7, not Reich."

The paper, *in extenso*, forms part of the 'Transactions of the Botanical Society of Edinburgh,' and will be received by botanists as a valuable contribution to our knowledge of the genera *Thalictrum* and *Polygala*; although we are fully aware that considerable difference of opinion will exist as to the *status* of the forms described. We are quite willing to leave this an open question, but at the same time acknowledge our great obligation to Mr. Babington, for the pains he has taken in collecting and arranging the materials so requisite to the formation of just conclusions.

On some Excrescences, &c., on Plants, occasioned or inhabited by Mites. By MR. JAMES HARDY.*

A FEW days ago, I met with several small galls on the leaves of the hackberry (*Prunus Padus*), which I expected would furnish the larva of a gall-midge (*Cecidomyia*) or gall-fly (*Cynips*). They are

* From the 'Proceedings of the Berwickshire Naturalists' Club.'

green or slightly purplish, obovate, thickish, white, hirsute, and are scattered over the upper surface of the leaf, like a crop of minute mushrooms. On opening them I found them hollow, without any apparent inmate, or anything remarkable except a few hairs, the continuation apparently of a thick crop placed at their orifice in the depression on the under side of the leaf. A few pink objects, however, at length caught my attention; and on reflection, knowing that such excrescences were sometimes ascribed to mites, I resolved to ascertain if these were not such. Next day, on shaking a few upon a slip of glass, and placing them under the microscope, I observed that they exhibited motion; and some of them were not long in pushing out their legs and crawling slowly about. They were all in the larva state, elliptical, round-bodied, with four short legs placed close behind the head; the abdominal part is long and flexible, and has about four hairs before the tip, and about as many near the shoulders. They are too minute to be seen by the naked eye; even under a triple lens, they are mere linear atoms, without vestige of limbs. They are white, yellow, pale brown, or pinkish. Two species of mites were found on the outside: one, a yellowish rapidly running species, common upon foliage, that appears to deposit its ova upon the hairs of the plants on which it occurs; the other was a true, flattish, pale whitish, testaceous *Acarus*, and is most likely the parent of the young mites in the gall.

Knowing there were many similar galls on leaves, I next investigated those hairy purple warts so abundant near the midrib of the sloe, and found them likewise to be nests of apparently the same species of *Acarus*.

The alternate blisters along the sides of the alder-leaf, and occasionally found on that of the birch, gave the same result. The species on the alder is probably different. The old mite accompanying them is a mere point, and is well distinguished by two or three squarish brown spots near the tip of the abdomen.

The leaf of *Salix aurita* offers not less than four different galls: one large and smooth, occasioned by a black saw-fly, (Linn. Fn. Suec. 2301); two caused by the larvæ of unknown species of gall-midge, (*Cecidomyia*); and a fourth minute purple one, which is very abundant, and is analogous to those occurring on the sloe and bird-cherry. The last, like them, contains only young mites.

Another locality for mites I find in some round bud-like productions on the twigs of hazel. From green they become yellowish, and then wither. The larva is white, as is the accompanying mite.

A rough, pale green or purplish, fungus-like gall, which opens

from the under side of the leaf, is abundant on the foliage of the alder in some of our deans. This is also a nursery of young Acari.

A conspicuous yellow gall near the summits of the stalks of *Galium verum*, growing on the sea-coast, is also owing to mites. The round fleshy galls of this plant are caused by the larvæ of a *Cecidomyia*.

Colonies of young mites distort the leaves of *Galium Aparine*, *Lotus corniculatus*, *Polygala vulgaris*, and *Campanula rotundifolia*, by causing them to assume fantastic shapes, to become discoloured, to thicken, or their margins to roll inwards. The foliage of *Galium Aparine* is also affected in this manner from the presence of the larvæ of *Psylla velutina* of Foerster, (Verhand. Natur. Vereins. Preuss. Rheinlande, 1848, p. 87); which appears not to differ from *Ps. Galii* of the same author. This *Psylla* produces similar effects on *Galium palustre* and *G. uliginosum*; and it lives likewise upon the leaves of *Comarum palustre*.

The hoary, rounded, woolly tufts, so abundant in some places at the summit of the shoots of the wild thyme, are also the production of a crowd of young mites, as was first ascertained by Loew, (Dipterologische Beitr. iv. 24). Lightfoot (Flora Scot. i. 318) attributes them to a *Chermes (Psylla)*; and Bremi thought they were owing to the larvæ of a gall-midge. The two Bauhins considered plants in this condition as a distinct species; the '*Serpillum vulgare*, minus, capitulis lanuginosis,' (C. Bauhini, Pinax, 220); '*S. vulgare*, capitulis tomentaceis, candicantibus,' (J. Bauhini, Hist. Plant. iii. 269). Tournefort, however, conjectured that such appearances were owing to the irritation occasioned by some insect pricking the buds (Hist. Plantes des Environs de Paris, 149. Paris: 1698).

I have not had an opportunity of examining lately these white tufts on the wild thyme; but young specimens that I brought from Northumberland in July, afforded no traces of a gall-midge, to which they had been ascribed by various writers.

In conclusion, I may mention that I shall feel obliged to any member of the Club for fresh specimens of the following galls, should they ever occur during their researches:—

Smooth galls on the leaves of the beech.

Smooth galls on the leaves or buds of the lime.

Galls on the dyer's green-weed, (*Genista tinctoria*).

Galls on the bryony and the box-wood.

Galls and excrescences on *Salix alba*, *S. purpurea*, and *S. fragilis*.

Large gall on the stalk of *Hieracium sabaudum* and *Cnicus arvensis*.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-fourth Sitting.—Saturday, April 23, 1853.

MR. NEWMAN, President, in the chair.

Lathræa squamaria in Cultivation.

The President read the following note, from Mr. Edward T. Bennet, dated Brockham Lodge, Surrey, April 20, 1853 :—

“Two years ago, several roots of this interesting plant were brought from a hedge in a shady lane in this neighbourhood, and planted in a hollow at the base of a hazel-tree in a damp part of our garden, being carefully placed in contact with its roots. The spikes of flowers continued to develop in their new abode ; but this might readily have been the case without real growth having taken place. Last spring, it did not make its appearance ; and we concluded the plant was lost. About a fortnight ago, however, we were surprised and delighted to see a fine spike pushing up through the soil, and which is now expanding its curious flowers, in perfect vigour.

“Happening to be near its native locality yesterday, I paid it a visit, and was rewarded by finding it flourishing, and apparently much increased since this time two years. It is just now in perfection, and would well repay the visit of any one who is a stranger to it, otherwise than as a dried plant.

“The under-ground rhizoma occupies the sloping side of the bank, in large masses ; but, after careful examination, I was unable to detect any actual union between them and such other roots as were interspersed, or any fibres that appeared to be roots of the plant itself. Is it, or is it not, a parasite ? ”

The President said that he thought the parasitism of *Lathræa* was a universally-admitted fact. There was positive evidence on the subject, from the pen of that *infallible* observer, Mr. Wilson, in an early number of the ‘Phytologist’ (Phytol. i. 92) ; and Mr. Bowman had previously proved the fact, in the ‘Linnæan Transactions’ (see Phytol. i. 24).

MICROSCOPICAL SOCIETY OF LONDON.

January 26, 1853.—George Jackson, Esq., President, in the chair.

Stellate Bodies in the Cells of Fresh-water Algæ.

A paper by the Rev. Wm. Smith, 'On the Stellate Bodies occurring in the Cells of Fresh-water Algæ,' was read.

After referring to the papers by Mr. Shadbolt, 'On the Sporangia of some of the Filamentous Fresh-water Algæ,' published in the third volume of the 'Transactions of the Microscopical Society,' the author stated that the stellate bodies which form the subject of this paper are not, in his opinion, the result of conjugation, as supposed by Mr. Shadbolt, but of some disease affecting the cells in which they are found, being, in fact, bodies of a parasitic, or perhaps of a fungoid, growth, consequent upon the degeneration of the cell-contents. To these star-like bodies he proposes to give the name of Asteridia, and adduced various facts which he considered as confirmatory of the opinion he had brought forward, of these bodies being examples of a singular and far from common monstrosity, produced by a peculiar disease affecting that curious and interesting class of plants.

Fungus, &c., in a living Oak Tree.

A paper by Professor Quekett, 'On the Presence of a Fungus, and of Masses of Crystalline Matter, in the Interior of a living Oak Tree,' was read.

Mr. Quekett stated that while dining with a pic-nic party in Marlborough Forest, in the immediate vicinity of the 'King Oak,' a large limb of a neighbouring oak fell with a loud crash. On investigating the fractured portion, which was nearly three feet in diameter, the centre was seen to be covered with a white filamentous mass, studded here and there with numerous crystals. When examined microscopically, the white mass was found to be made up entirely of the fibres of a minute fungus, many spores of which were adherent to the fibres. The crystals were mostly of a tabular form, and were ultimately connected with the fungus, their composition being probably some salt of lime. No indications of decay were to be observed on the outside of the branch, nor any external wound whereby the spores could have gained access to the interior. All the parts of the wood in the neighbourhood of the fungus were rather softer than usual, and the woody fibres having been displaced by the growth of the filaments,

cavities were formed ; and in these the crystals were the most abundant. The occurrence of a fungus in the heart of a living oak-tree the author believed had never yet been recorded ; and its presence in this instance might lead to its detection in oak-timber previous to its being employed for building purposes.

THE PHYTOLOGICAL CLUB,
(in connexion with the Pharmaceutical Society).

April 4, 1853.—Robert Bentley, Esq., F.L.S., &c., President, in the chair.

A donation of British plants, from Mr. J. C. Braithwaite, was announced.

An adjourned discussion on M. Ville's experimental researches on vegetation took place.

Asplenium viride at Danny.

Mr. Reynolds introduced the subject of the discovery of *Asplenium viride* at Danny, communicated to the January meeting of the Botanical Society of London, by Mr. T. Moore (see Phytol. iv. 842).

That paper offering no clew to the origin of the station for the fern, he was induced to call attention to the following fact, which might throw some light upon the case. In Derham's 'Remains and Life of John Ray,' it is stated that the illustrious naturalist spent the latter end of 1667, and the beginning of 1668, at Danny, with Mr. Burrell and Mr. Courthope, both of whom had been his pupils, at Trinity College, Cambridge. There is no reason to suppose that the plant was introduced by Ray himself ; for, that he was then unacquainted with it, is shown, by its not being mentioned in his 'Catalogus' (ed. 2, 1677). In the 'Synopsis' (1690) it is given, but on the authority of Sibbald's 'Prodromus,' and the MS. notes of Edward Llywd.

May it not, however, reasonably be supposed that the then owner of Danny (Mr. Courthope) possessed tastes similar to those of his friend John Ray ? If so, it is probable that he had under cultivation interesting indigenous plants not belonging to the Flora of the neighbourhood ; and his attention could hardly fail to be attracted to the ferns, a class first put by Ray on at all an intelligible footing.

Once established, a plant may long retain its station. Specimens of *Hutchinsia petraea*, collected on the walls of the churchyard at Eltham, were exhibited to the meeting, having originally escaped from

the garden of Sherard, who died in 1728. That bricks may form a favourable groundwork for *Asplenium viride*, is shown by Mr. Newman in his 'History of British Ferns.' In mentioning a station for it at Ham Bridge, Worcestershire, he says:—"As I approached the bridge, the red bricks of which it is built, and the dry and dusty road which passed over it, seemed in no degree to increase the chance of success; yet on that bridge, facing the roadway and covered with dust, was the identical plant I sought—small indeed, but the species not to be mistaken."

Mr. Reynolds had observed (Phytol. iv. 210) that Mr. Newman had even extended his suggestion to him, as to the origin of *A. viride*, by referring *Ceterach* and *Dryopteris* to the same source.

Mr. Williamson was personally acquainted with the Flora of the district in question, and could state that it contained many things that had been certainly introduced. This was especially the case with a number of species found in a wood immediately at the back of the mansion; and he considered the most satisfactory way of accounting for their presence, was upon the supposition that they had, at some remote period, been cultivated by the possessor of Danny.

Tillandsia usneoides as a Substitute for Horse-hair.

The attention of the meeting was called to a vegetable substitute for horse-hair, in upholstery. It is called "American moss;" and chairs, &c., stuffed with it are exhibited for sale in some shops in London. It is the produce of *Tillandsia usneoides* (Bromeliaceæ), an epiphytic plant, growing on the cypress-trees upon the banks of the Mississippi River. At the first glance, its appearance is not unlike that of hair; but closer inspection shows the joints of its wiry stems. Although possessing some elasticity, it will not compare, in this respect, with horse-hair: its advantage consists in a smaller cost at first.

In connexion with this subject, it was mentioned that the indigenous carragheen (*Chondrus crispus*) used to be extensively collected on our coasts, for the purpose of stuffing mattresses.

[The following extract contains a further account of the *Tillandsia*:—*Ed. Phyt.*

"*Tillandsia usneoides* deserves, for its uses and appearance, to be shortly described. The stem is no bigger than a thread; the skin whitish, as if covered with hoar-frost; within tough and black like a horse-hair. Many of these together stick on the branches of the ebony or other trees, superficially by the middle, and send down on each side some of the same stems, very often a yard long, hanging on both sides, curled, or turning and winding one within another, and

resembling an old man's beard, whence its common name in Jamaica. The stems are branched, and the branches, which are two or three inches long, are set with roundish, white, frosted leaves. The flowers come out at the end of the branches. This slender parasitical plant is found among the trees in many parts of Jamaica, but does not grow so commonly, nor so luxuriantly, there as it does in the more northern provinces of the main continent, where it is said to overrun whole forests. It is frequently imported from Jamaica to North America, for the use of the saddlers and coach-makers, who commonly stuff their panels, cushions, &c. with it. In Louisiana and the neighbouring settlements, this plant being very carefully gathered and stripped of the bark, is made into mattresses, cushions, panels, &c. It is manufactured by tying the stalks in bunches, and sinking them in water, or burying them under ground in a moist place, until the bark rots: they are then taken up, boiled in water, and washed, until the fibres are quite cleared of the pulp. These are not only used instead of horse-hair, but are so very like it, that a man cannot distinguish them without a strict examination, and that even with a glass, unless he observes the branchings of it.

"The Bonana bird's nest is always made of the fibres of this plant, and is generally found hanging by a few threads from the tops of the most expanded branches of the most lofty trees, especially those that spread over ponds or rivers."—*Loudon's Encyc. of Plants*, p. 248.]

The 'Bonplandia,' the official organ of the Imperial L. C. Academy Naturæ Curiosorum, announces that the six naturalists mentioned below have received the honour of Fellowship in the Academy, with the accompanying Academical names:—

1. H. C. Beck, Pastor in Schweinfurt = Metzger
2. Anatol Nicolajewitsch, Prince of Demidoff, who,
it will be recollected, sent the principal part of
the Russian articles to the Exhibition of 1851 = Franklin
3. Edward Newman, of London = Latreille
4. F. L. Fülleborn, President of the Court of Appeal
in Marienwerder = Röschlaub
5. F. Goldenberg, Professor of Natural History and
Mathematics in Saarbrücken = Steinhauer
6. Philip Wirtgen, Ph. D., Director of the College
in Coblenz = Ehrhart

The Natural History of the Cedron.
By BERTHOLD SEEMANN, Esq., F.L.S., &c.

THE Cedron (*Simaba Cedron*, Planch.), one of the Simarubaceæ, has probably been known to the aborigines of New Granada from time immemorial, and was early brought to the notice of Europeans. In 'The History of the Buccaneers,' a work published in London in the year 1699, is to be found the first account of the Cedron. Its use as an antidote for the bites of snakes, and its place of growth,—the Island of Coyba, on the coast of Veraguas,—are there distinctly stated; but whether on the authority of the natives, or on that of the Buccaneers, does not appear. If the former was the case, the rovers must have become acquainted with the tree while on some of their cruises on the Magdalena river; for in the Isthmus of Panama its very existence was unsuspected until lately; the seeds being always imported from Cartagena. Mutis, as would appear from a communication of Dr. Cespedes, seems to have been acquainted with the Cedron, and doubtless wrote upon it; but, as most of his works were burnt, by order of the Spanish Government, on the principle that "learning did not become Creoles," that account has not been handed down to us. But, as may be suspected, a plant possessing such beneficial properties as the Cedron, and rendered famous by both the traditions and the history of the country which it inhabited, was not doomed to oblivion. About the year 1843, the Government of New Granada sent a commission of several medical men and students, accompanied by Dr. Cespedes, Professor of Botany in the University of Bogota, to ascertain what plant and locality produced the Cedron, and in what quantities the seeds might be procured. The commission seems to have reported so favourably upon the subject it was despatched to investigate, that the Cedron was speedily introduced into the pharmacopœias of New Granada; and it is now to be seen in all the apothecaries' shops of that republic. The commission did not settle the question botanically, still it may be said to have led to its solution; for when Mr. William Purdie, late Collector for the Royal Botanic Gardens at Kew, was at Bogota, his attention was directed to the plant in question by Dr. Cespedes, who supplied a tolerably correct drawing of it, and also information respecting the exact locality in which the celebrated antidote was to be met with. Mr. Purdie, taking advantage of the intelligence, proceeded, in 1846, to the banks of the Magdalena; but on reaching the village of Nari,

one of the places where the plant grows, he found that the inhabitants had already collected their little hoard of Cedron, and could only be induced to show to him a few seeds, unless he would purchase some, which he was not inclined to do, as all those shown to him had lost their germinating power; the people told him, moreover, that it would be useless to search for more fruit, all the trees having been already pillaged. Not deterred by such discouraging prospects, Mr. Purdie commenced searching the forest in all directions; and after an exertion of three days he succeeded in obtaining about thirty ripe fruits, and perfect leaves and flowers of the tree. Some of the seeds were sown in a Wardian case, and, together with the specimens for the herbarium, transmitted to the Royal Botanic Gardens at Kew, where the former soon became young plants, and whence they were distributed amongst various botanical and horticultural establishments; while the latter were briefly described by Dr. Planchon, in his dissertation on Simarubaceæ (Hooker's 'London Journal of Botany,' vol. vi. p. 566), under the name of Simaba Cedron. Attempts have been made to wrest from Mr. William Purdie the honour of having been the actual discoverer of the Cedron, and to confer it upon Dr. Luigi Rotellini. Historical evidence pronounces against such an arbitrary change. It is true that Dr. Rotellini, in a paper intitled 'Observazioni terapeutiche sopra alcuni Prodotti Vegetali della Nuova Granada,' printed in the 'Annali Medico-Chirurgici del Dottor Telemaco Metaxò' (anno vii. vol. xii. p. 281), drew the attention of the scientific world to the Cedron; but the learned Doctor himself never saw the tree, referred the plant to Apocynæ, and mixed up his account with various fables and inaccuracies, derived from oral communications of the aborigines; while Mr. Purdie not only inspected the tree in its *native* locality, and gave an intelligible account of its virtues and properties, but collected such specimens as enabled competent botanists to determine the systematical station of the plant.

It had been supposed that the Cedron was to be found only on the banks of the Magdalena; but, about the year 1845, a Panamanian gentleman ascertained it to grow in Darien; and, in 1847, 48, and 49, I myself found it in various parts of Darien, Veraguas, and Panama. The specimens transmitted by me, together with those previously sent by Mr. Purdie, enabled Sir Wm. J. Hooker to publish, in December, 1850, a full description of the plant, and accompany it by an excellent figure, from the skilful pencil of Mr. William Fitch. To complete the history of the Cedron, it is necessary to add that on the 7th of April,

1851, at a meeting of the Paris Academy of Science, it was announced that M. Lecoy had succeeded in separating the active principle on which the therapeutic properties of the Cedron depend, and that he had called it "*cedrine*." Thus, it took exactly 150 years, after the Cedron was first brought into notice, before a satisfactory account of the tree and its properties was obtained.

The Cedron seems to be confined to the republic of New Granada, ranging between about the 5th and 10th parallels of North latitude, and the 75th and 83rd of West longitude. It is generally met with on the outskirts of woods, on the banks of rivers, and on the seashore, but is never found under other trees; and although it occasionally forms small groves, yet it never constitutes extensive woods of itself, and must always be considered as a rare plant. The tree attains about fifteen feet in height; the stem, when about twelve feet high, produces a terminal panicle, which prevents it from prolonging itself; but, instead, side branches appear, which also, in their turn, send forth their terminal flowers and side branches. The effect of this mode of growth is, that the tree looks as if cut, something like *Salix capitata*, or perhaps more like a full-grown *Cycas circinalis*, and may therefore be called a "magnified umbrella." In diameter the stem seldom exceeds six inches. The pinnated leaves are glabrous, from two to three feet long, and have generally more than twenty leaflets. The panicle (not raceme) is very often from three to three and a half feet long, and bears flowers about an inch in diameter, the corollas of which are externally covered with a brownish hair; internally, they are glabrous, and of a greenish colour. The stamens are ten in number, and the ovaries five; but in most cases only one of the latter is developed into a mature fruit, the rest being usually abortive. The fruit, about the size of a swan's egg, has the appearance of an unripe peach, being covered with a short hair. Each of these fruits (drupes) contains one seed (the Cedron of commerce), easily separated into two large cotyledons, which look very much like blanched almonds, but are larger and plano-convex.

Every part of the plant, but especially the seed, is, owing to the presence of cedrine, intensely bitter. On account of this principle, it is extensively, and with considerable success, used in cases of intermittent fever, by the physicians of New Granada, a country in which forests of Quina-trees abound. But the chief reputation of the Cedron rests upon its being considered an efficacious antidote for the bites of snakes, scorpions, centipedes, and other noxious animals; and so highly do the natives of the land in which it grows value it,

that they will pay as much as from one to four shillings for a single seed. Indeed, there is hardly a person in New Granada or the adjacent states who does not possess a piece (cotyledon) of Cedron; the lower classes carrying it on a cord around the neck; the upper, mostly in their purses or cigar-cases. When any one is bitten, a little, mixed with water, is applied to the wound, and about two grains are scraped into brandy, or, in the absence of that liquor, into water, and administered internally; and it is universally believed that the application will neutralize the venom of the most dangerous reptiles and other animals.

Nothing more seems to be known of the Cedron. Whether in all climates, and against the bites of all venomous animals, it will prove an efficacious antidote; whether it will ultimately be considered a more powerful agent for counteracting the fever than quinine; is at present impossible to say. One thing is certain,—that the Cedron, unless propagated by artificial means, will always be a scarce article, and consequently too expensive to be generally employed, or to be used as a substitute for drugs which, produced spontaneously by Nature, may be obtained in unlimited quantities, and at a cheap rate.

BERTHOLD SEEMANN.

Kew, April 1853.

Revision of the Genus Nymphæa. By Dr. C. LEHMANN.

SINCE the introduction of the *Victoria regia* into Europe, all water-plants, especially the *Nymphæaceæ*, have engaged the attention of both botanists and gardeners; in fact, they have become the fashion: and at such a time the publication of a monograph on *Nymphæaceæ*, prepared by Dr. Lehmann, one of the most accomplished botanists of the day, is extremely opportune. The first section of this monograph has just appeared, and is to be considered as a *Prodromus*. Afterwards the whole is to be reprinted, and accompanied by figures of the new and little-known species. The following abstract* will give some notion of the vast labour the author has undertaken. For such a task Dr. Lehmann deserves the thanks of every naturalist; and we sincerely hope that all those who may have in their possession any

* From E. Otto's 'Gartenzeitung,' May, 1853.

specimens of Nymphæacææ, will not fail to send them to him for examination, as many of our most eminent *savans* have already done.*

NYMPHÆA.

De Cand. Syst. Veget. vol. ii. p. 49; *Endl. Gen. Plant.* No. 5020;
Planch. in Flore des Serres et Jard. vol. vii. p. 293.

Coordinatio Nymphæarum, adjectis descriptionibus novarum specierum.

Sect. I. APPENDICULATÆ.

Staminibus omnibus vel saltem exterioribus appendice conico elongato colore petalorum supra antheras valde prominente instructis; foliis subpeltatis integerrimis vel subintegerrimis repandisve vel obsolete dentatis, rarius acute dentatis; rhizomate abbreviato perpendiculari tuberosi, vel discoideo v. subgloboso v. pyriformi v. fusiformi, radicibus sæpe valde incrassatis carnosis et bulbillis tuberibusve in nonnullis filo tenero matri alligatis.

Trib. I. LEUCANTHOS (Cyanea, DC. ex parte).

Floribus albis vel albo-virentibus.

* Foliis integerrimis nervis tenuibus. No. 1—9.

** Foliis amplis manifeste dentatis, nervis subtus prominentibus.
No. 10—15.

Trib. II. RHODANTHOS.

Floribus roseis. No. 16—18.

Trib. III. BULBOPHYLLON.

Foliis integerrimis inter lobos bulbilliferis, floribus albis carneis vel cærulescentibus. No. 19—21.

* Dr. Lehmann earnestly begs that botanists will be kind enough to allow him the loan of their specimens of Nymphæacææ. Any parcel addressed to Professor Dr. Lehmann, Hamburg, Botanischer Garten, will reach its destination.

Trib. IV. CYANANTHOS (*Cyanea*, *DC.*)

Floribus cæruleis vel cærulescentibus.

- * Stamina omnibus appendiculatis. No. 22—27.
- ** Stamina exterioribus tantum appendiculatis. No. 28—30.

Sect. II. INAPPENDICULATÆ.

Staminibus connectivo brevissimo obtuso vix manifesto ultra antheras producto instructis, vel omnino apiculo destitutis.

Trib. I. LOTOS (*Lotos*, *DC.* ex parte).

Connectivo brevissimo obtuso vix manifesto ultra antheras paululum producto; foliis amplis, peltatis, umbonatis, nervis venisque subtus valde prominentibus areolatis; rhizomate et radicibus ut in appendiculatis.

- * Foliis acute dentatis, dentibus mucrone aristiformi in plurimis terminatis et sinibus inter dentes semilunatis.
 - α.* Floribus sanguineis. No. 31.
 - β.* Floribus albis vel dorso rubellis. No. 32—36.
- ** Foliis irregulariter obtuse dentatis s. crenatis. No. 37—39.

Trib. II. CHAMÆLOTOS (*Lotus*, *DC.* ex parte).

Connectivo ut in *Lotis*; floribus albis; foliis in plurimis multo minoribus quam in trib. præcedente, subpeltatis, integerrimis, nervis venisque tenuibus vix prominulis; rhizomate et radicibus ut in appendiculatis. No. 40—50.

Trib. III. CASTALIA, *Sal.*, *DC.*

Staminibus apiculo omnino destitutis; foliis integerrimis rarissime subdentatis, usque ad petiolum fissis; rhizomate elongato horizontali, cylindrico, repente.

- * Floribus albis (*Leuconymphæa*, *Boerh.*) No. 51—63.
- ** Floribus cæruleis. No. 64.

Sect. I. APPENDICULATÆ.

Trib. I. LEUCANTHOS.

- * Foliis integerrimis nervis tenuibus.

1. *Nymphæa Raja*, *Lehm.* (V. s.) N. foliis membranaceis tenuissimis sublunatis, lobis divaricatis s. patentissimis obtusis, glabris, subtus—

dum siccis—punctis elevatis sub lente manifestis; calyce tetrasepalo, sepalis longe acuminatis; petalis lanceolatis longe et argute acuminatis albis; staminibus valde elongatis radiatim expansis purpureis exterioribus brevi appendiculatis; stigmatе 20-22-radiato: radiis longissimis. In Ecuador (Jameson); in Chili (Lehmann). Per.

2. *Nymphæa gracilis*, Zucc. in Abhandl. der Mathem. Physik. Klasse der Bayr. Acad. der Wissensch. vol. i. p. 362, No. 29. (V. s.)

3. *Nymphæa pulchella*, DC. Syst. Veget. vol. ii. p. 51, No. 5; ejusd. Prodr. vol. i. p. 115. (V. s.)

4. *Nymphæa maculata*, Thonng.; Schumach. in Act. Soc. Scient. Havn. (Vidensk. Selsk. Skrift.), 1827, p. 247. (V. s.)

5. *Nymphæa flavo-virens*, Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 370. (V. v.)

6. *Nymphæa abbreviata*, Guill. Perrtt. et Rich. Tent. Fl. Senegamb. fasc. i. p. 16.

7. *Nymphæa pseudo-pygmaea*, Lehm. (V. s.) N. foliis membranaceis subrotundis repandis, basi profunde bilobis sagittatis, lobis patentibus obtusiusculis, sinu triangulari, utrinque glabris, supra—si siccis—punctis minutis densissimis sub lente manifestis, calyce tetrasepalo; petalis lato-lanceolatis acutis albis calycem vix æquantibus; staminibus paucis appendiculatis; stigmatе sub 12-radiato: radiis brevibus. Senegambia. Per.

8. *Nymphæa Leiboldiana*, Lehm. (V. s.) N. foliis coriaceis subpeltatis oblongis obtusiusculis vel ellipticis glabris, basi profunde bilobis, lobis acutiusculis basi arcuatis apice attingentibus vel incumbentibus, supra—si siccis—punctis minutissimis elevatis sub lente manifestis, subtus nervis prominulis subcanaliculatis; calyce tetrasepalo; petalis lanceolatis acutis albis; staminibus permultis appendiculatis erectis corolla dimidio brevioribus; stigmatе multiradiato: radiis erectis incurvis. In terris Mexicanis (F. Leibold!); in Asia australi (Burke?). Per.

9. *Nymphæa tropæolifolia*, Lehm. (V. s.) N. foliis coriaceis orbicularibus subpeltatis repandis vel obtuse remoteque dentatis, utrinque glabris læte viridibus, basi profunde bilobis, lobis incumbentibus obtusiusculis, supra—si siccis—punctis elevatis minutissimis sub lente manifestis, subtus nervis prominulis parum impressis; calyce tetrasepalo; petalis oblongo-lanceolatis acutis albis; staminibus erectis longe appendiculatis; stigmatе sub 16-radiato: radiis acutis inflexis. Habitat in Brasilia prope Bahiam in aquis stagnantibus, et in Surinamia. Per.

**** Foliis amplis manifeste dentatis, nervis subtus prominentibus.**

10. *Nymphæa speciosa*, Mart. et Zucc. Abhandl. der Mathem. Physik. Klasse der Bayr. Acad. der Wissensch. vol. i. p. 361, No. 28. *N. reticulata*, Mart. Sched. de Nymph. in Itin. Brasiliens. Conscript. No. 3313, MSS. (V. s.)

11. *Nymphæa undulata*, Lehm. (V. s.) *N. foliis coriaceis ovato-suborbicularibus subpeltatis glaberrimis utrinque pallide viridibus, irregulariter dentatis vel subsinuatis, basi profunde bilobis, lobis approximatis obtusiusculis, subtus nervis prominentibus ibidemque tenuissime impresso-punctatis; calyce tetrasepalo undulato; petalis oblongis acutatis albis superne undulatis; staminibus permultis erectis acute appendiculatis; stigmatibus sub 12-radiato: radiis abbreviatis acutis. Nuphar fleur blanche charnue, H. Galeotti, Collect. 1840, No. 4846? Habitat in terris Mexicanis. Per.*

12. *Nymphæa ampla*, Hook. Bot. Magaz. vol. lxxv. tab. 4469 (excl. syn. DC.); A. Gray, Plant. Wrightian. Texano—Mexic. pars i. p. 7. *Castalia ampla*, Salisb. (V. s.)

13. *Nymphæa nervosa*, Herb. Steud. (nomen.) (V. s.) *N. foliis amplis coriaceis subpeltatis suborbicularibus glabris utrinque viridibus basi profunde bilobis, lobis elongatis incumbens, inæqualiter acuteque sinuato-dentatis nervosis, nervis venisque utrinque valde conspicuis subtus prominentibus canaliculatis; calyce sex-sepalo; corolla alba magna, petalis inæqualibus, exterioribus oblongis obtusiusculis, interioribus lineari-lanceolatis longe acutatis; staminibus appendiculatis; stigmatibus multiradiato. In Brasilia australi (J. Hansen, herb. propr.); in Paraguay (Bergger, Herb. Steudel.) Per.*

14. *Nymphæa nubica*, Lehm. (V. s.) *N. foliis amplissimis membranaceis peltatis suborbiculato-ovatis glabris, irregulariter obtuseque repando-dentatis subsinuatis, basi profunde bilobis, lobis incumbentibus obtusiusculis, utrinque viridibus, supra glaucescentibus ad nervos venasque punctis elevatis sub lente conspicuis, subtus grosse areolatis nervis parum prominentibus; floribus amplis patentissimis albis; calyce tetrasepalo maculato; staminibus appendiculatis; stigmatibus sub 16-radiato. Nymphæa ampla, Kotschy, Iter Nubic. No. 167 (ex parte!) In stagnis pluvialibus ad radices mont. Cordofani. Per.*

15. *Nymphæa versicolor*, Roxbg. Bot. Magaz. vol. xxix. tab. 1189; Roxbg. Fl. Ind. vol. ii. p. 577, No. 3; DC. Syst. Veg. vol. ii. p. 15, No. 12; ejusd. Prodr. vol. i. p. 115. *Nuphar versicolor*, Reich. Fl. Exot. vol. i. tab. 15 (fig. e Bot. Magaz. l. c.) *Castalia versicolor*, Salisb.

Trib. II. RHODANTHOS.

16. *Nymphæa bella*, Lehm. (V. s.) N. foliis submembranaceis peltatis oblongis rotundato-obtusis, medio præsertim acute repando-dentatis, basi profunde bilobis, lobis dente acuto terminatis, sinu aperto, supra glabris punctis elevatis ad lentem manifestis, subtus densissime pubescentibus cinereis; calyce tetrasepalo; corolla polypetala rosea, petalis inæqualibus angusto-lanceolatis obtusiusculis; staminibus appendiculatis; stigmatibus sub 12-radiato: radiis brevibus subplanis. In India Orientali. Per.

17. *Nymphæa Hookeriana*, Lehm. (V. s.) N. foliis coriaceis peltatis ovalibus repandis basi profunde bilobis, lobis obtusiusculis, sinu aperto, utrinque viridibus glabris supra impressis punctatis, subtus—dum siccis—punctis minutissimis elevatis sub lente conspicuis, nervisque canaliculatis; calyce tetrasepalo; petalis ex ovato oblongis obtusiusculis roseis; staminibus acute longeque appendiculatis; stigmatibus sub 10-radiato: radiis brevibus erectis. In Benghalia (J. D. Hooker). Per.

18. *Nymphæa rhodantha*, Lehm. (V. s.) N. foliis submembranaceis subpeltatis ovalibus utrinque glabris vinoso-rubentibus, irregulariter repando-dentatis, basi profunde bilobis, lobis approximatis sive incumbentibus obtusiusculis vel acutis, supra—dum siccis—punctis elevatis minutis sub lente manifestis, subtus nervis prominulis canaliculatis; calyce tetrasepalo; petalis oblongis obtusiusculis roseis; staminibus obtuse appendiculatis; stigmatibus sub 12-radiato: radiis erectis apice hamato-inflexis. In insulis Philippinis. Per.

Trib. III. BULBOPHYLLON.

19. *Nymphæa vivipara*, Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 370. N. micrantha, Bot. Magaz. vol. lxxvi. tab. 4535 (excl. syn.) N. cærulea, β . albida, Rich. Tent. Fl. Senegamb. fasc. i. p. 15. (V. v.)

20. *Nymphæa guineensis*, Thonng.; Schum. in Act. Soc. Scient. Havn. (Vidensk. Selsk. Skrift.) 1827, p. 248. N. micrantha, Hortul. (non Rich.) (V. v.)

21. *Nymphæa micrantha*, Guill. Perrott. & Rich. Fl. Senegamb. fasc. i. p. 16.

Trib. IV. CYANANTHOS.

* *Staminibus omnibus appendiculatis.*

22. *Nymphæa Edgeworthii*, Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 372. *N. punctata*, *Edgewith. in Trans. Linn. Soc.* vol. xx. p. 29, No. 15 (non Kar. et Kir.)

23. *Nymphæa stellata*, Willd. Spec. Plant. tom. ii. pars ii. p. 1158; Andr. Bot. Repos. vol. v. tab. 330; DC. Syst. Veg. vol. ii. p. 51, No. 4; ejusd. Prodr. vol. i. p. 115; Wight, Icon. Plant. tab. 178 (tab. non inspecta); Roxbg. Fl. Ind. vol. ii. p. 597, No. 6; Rheed. Hort. Malab. vol. xi. tab. 27. *N. malabarica*, *Poiret in Encycl. Method. Botan.* iv. p. 457, No. 4. *N. Nouchali*, *Burm. Encycl. Method.* l. c. No. 7; Poiret, Conf. DC. Syst. Veg. vol. ii. p. 51, Obs. ad No. 4. *Castalia stellaris*, *Salisb.* *Lobocarpus Candollianus*, *Wight et Arnth. Herb. Wight.* No. 55 (fide speciminum). *β. major*, *Bot. Magaz.* vol. xvi. tab. 2058. *N. cyanea*, *Roxbg. Fl. Ind.* vol. ii. p. 577, teste Wight et Arnth. Prodr. Fl. Penins. Ind. Orient. p. 17, No. 55, et fide spec. authent. *N. Cochlara*, *Roxbg. Icon. in Mus. Soc. Ind. Orient. Lond. et in Muss. Hook.* tab. 659, teste Wight et Arnth. l. c. in *Add.* p. 446. *γ. flore albo.* (V. v. *α.* et *γ.*, *β. v. s.*)

24. *Nymphæa madagascariensis*, DC. Syst. Veg. vol. ii. p. 50, No. 3; ejusd. Prodr. vol. i. p. 114.

25. *Nymphæa capensis*, Thunbg. Prodr. et Fl. Capens. ed. Schult. p. 431; Conf. Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 372. *N. cærulea*, *Bot. Mag.* vol. xvi. tab. 552; *Andr. Bot. Repos.* vol. iii. tab. 197. *N. scutifolia*, *DC. Syst. Veg.* vol. ii. p. 50, (No. 1; *ejusd. Prodr.* vol. i. p. 114; *Flore des Serres et Jard.* vol. vi. No. 645. *Castalia scutifolia*, *Salisb.* (V. v.)

26. *Nymphæa discolor*, Herb. Steud. (nomen). (V. s.) *N. foliis submembranaceis subpeltatis ovato-orbicularibus glabris amplissimis, irregulariter sinuato-crenatis basi profunde bilobis, lobis basi incumbentibus subparallelis obtusiusculis, subtus atrosanguineis nervis venisque ibidem prominulis viridibus; floribus amplis patentissimis cyaneis; calyce tetrasepalo; petalis oblongo-lanceolatis biseriatis subæqualibus; staminibus numerosis omnibus longe appendiculatis; stigmatibus sub 12-radiato.* *N. ampla*, *Hochst. Herb. Unius Itin.* (ex parte!) In Nubia (Kotschy). Per.

27. *Nymphæa pœcila*, Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 371 et 425. *N. cærulea*, *Sieber, Herb.* (ex parte!) (V. v.)

**** *Staminibus exterioribus tantum appendiculatis.***

28. *Nymphæa elegans*, Hook. in Bot. Magaz. vol. lxxvii. tab. 4604; A. Gray, Plant. Wrightian. Texano—Mexican. pars i. p. 7 et 129. (V. s.)

29. *Nymphæa cærulea*, Sav. in Annal. du Muséum d'Hist. Nat. vol. i. p. 366, tab. 25; Venten. Jard. de la Malmais. tab. 6; Del. in Descript. de l'Egypte, ed 2, tom. xix. p. 422, tab. 60, fig. 2; DC. Syst. Veg. vol. ii. p. 50, No. 2; ejusd. Prodr. vol. i. p. 114; Fl. des Serres et Jard. vol. vii. No. 653 (?). *β. flore albo.* N. rufescens, Guill. Perr. et Rich. Tent. Fl. Senegamb. fasc. i. p. 15 (?). *Castalia cærulea*, Trattn. (V. v.)

30. *Nymphæa gigantea*, Hook. in Bot. Magaz. vol. lxxviii. tab. 4647; Fl. des Serres et Jardins, vol. vii. No. 751 (eadem figura). (V. s.)

Sect. II. INAPPENDICULATÆ.

Trib. I. LOTOS.

* *Foliis acute dentatis, dentibus mucrone aristiformi in plurimis terminatis et sinubus inter dentes semilunatis.*

α. Floribus sanguineis.

31. *Nymphæa rubra*, Roxbg. Andr. Bot. Repos. vol. viii. tab. 503; Roxbg. Fl. Ind. vol. ii. 576; ejusd. Icon. in Mus. Soc. Ind. Orient. Lond. et in Mus. Hook. tab. 657, teste Wight et Arnth. Prodr. Fl. Penins. Ind. Orient. in Add. p. 447; Bot. Magaz. vol. xxxi. tab. 1280; DC. Syst. Veg. vol. ii. p. 52, No. 7; ejusd. Prodr. vol. i. p. 115; Wight, Illustr. of Ind. Bot. vol. i. tab. 10; Paxt. Mag. of Gard. and Bot. vol. xi. p. 265, cum icon.; Flore des Serres et Jard. vol. vi. No. 629 (ead. fig.); Fl. des Serres, vol. vii. No. 759—60; Lindl. and Paxt. Fl. Gard. 1851, No. 17, tab. 50. *Nuphar rubrum*, Reichenb. Fl. Exot. vol. i. tab. 16 (fig. e Bot. Magaz.) *Castalia magnifica*, Sal. Par. Lond. tab. 14 (tab. non inspecta), ex DC. Syst. Veg. *β. Devoniensis.* N. Devoniensis, Hook. in Bot. Magaz. vol. lxxviii. tab. 4665. *γ. rosea*, Bot. Magaz. vol. xxxiii. tab. 1364. (α. v. v., β. v. s.)

β. Floribus albis vel dorso rubellis.

32. *Nymphæa pubescens*, Willd. Spec. Plant. tom. ii. pars ii. p. 1154; DC. Syst. Veg. vol. ii. p. 52, No. 8; ejusd. Prodr. vol. i. p. 115 (excl. syn. Pal. de Beauv.); Roxbg. Icon. in Mus. Soc. Ind. Orient. Lond. et in Mus. Hooker. tab. 658, teste Wight et Arnth.; Prodr. Fl. Penins. Ind. Orient. in Add. p. 447; Blume, Bijdrag. tot de Fl. van Nederl. Indië, vol. i. p. 48. *Castalia sacra*, Salisb. (V. s.)

33. *Nymphæa Lotus*, Linn. Sp. Plant. p. 729; Alpin, de Plant. Exotic. tab. 213, 216, 218, 220, 222, 224, 226; Del. in Annal. du Muséum d'Hist. Nat. vol. i. p. 372, et in Descript. de l'Egypte, ed. 2, vol. xix. p. 415, tab. 60, fig. 1 (excl. syn. Pal. de Beauv. Waldst. et Kit. Bot. Mag. et Rheed.); DC. Syst. Veg. vol. ii. p. 53, No. 9; ejusd. Prodr. vol. i. p. 14; Roxb. Fl. Ind. vol. ii. p. 557; Icon. Plant. in China nasc. e Bibl. Braam. tab. 16 (tab. non inspecta); Rich. Tent. Fl. Seneg. fasc. i. p. 14. *Castalia mystica*, *Salisb.* (ex parte). *β. semiaperta*. N. Lotus, *β.*, *Guill. Perrot et Rich. Tent. Fl. Seneg.* l. c.; *Rheed. Hort. Malab.* vol. xi. tab. 26. N. pubescens, *nonnull. Auct.* (non Willd.) (V. s. *α.* et *β.*)

34. *Nymphæa dentata*, Thonng.; Schumach. in Act. Soc. Scient. Havn. (Vidensk. Selsk. Skrift.) 1827, p. 249; Bot. Magaz. vol. lxxii. tab. 4257; Flore des Serres et Jardins, vol. vi. No. 627—628 (?). (V. v.)

35. *Nymphæa thermalis*, DC. Syst. Veg. vol. ii. p. 54, No. 10; ejusd. Prodr. vol. i. p. 115; Reichenb. Icon. Fl. Germ. tab. 71; Fl. des Serres et Jard. vol. vii. No. 706, 707. N. Lotus, *Andr. Bot. Repos.* vol. vi. tab. 391; *Bot. Magaz.* vol. xxi. tab. 797; *Waldst. et Kit. Plant. Rar. Hung.* vol. i. tab. 15 (excl. syn.) *Castalia mystica*, *Salisb.* (ex parte). (V. v.)

36. *Nymphæa Candolliana*, Lehm. N. ampla, DC. Syst. Veg. vol. ii. p. 54, No. 11 (excl. syn. *nonnull.* et var. *β.*); ejusd. Prodr. vol. i. p. 115 (non *Salisb.*); *Plum. MSS.* 123, tab. 4 (tabula non inspecta), ex DC. (V. s.)

** Foliis irregulariter *obtusè* dentatis s. crenatis.

37. *Nymphæa Rudgeana*, Meyer, Prim. Fl. Essequib. p. 198. N. ampla, *β. Rudgeana*, DC. Syst. Veg. vol. ii. p. 54, sub No. 11; ejusd. Prodr. vol. i. p. 115. (V. s.)

38. *Nymphæa sinuata*, Salzmann. In vicinibus Obidos, Prov. Para (R. Spruce). *Nymphæa* foliis circinnatis minoribus *obtusè* crenatis, flore albo. *Plum. Catal.* p. 7; *Msc.* 122, tab. 4 et 141, tab. 5 (?), (tab. non inspectis). (V. s.)

39. *Nymphæa semisterilis*, Lehm. (V. s.) N. foliis coriaceis ovato-suborbicularibus subretusis subpeltatis glabris sinuato subcrenatis basi profunde bilobis, lobis contingentibus basi incumbens obtusis, superne—dum siccis—punctis minutis densissimis elevatis sub lente conspicuis, subtus impresso-punctatis nervosis; calyce tetrapalo; petalis albis calycem æquantibus; staminibus inappendiculatis biseriatis, exterioribus sterilibus sublinguæformibus, interioribus

ribus fertilibus multo brevioribus; stigmate sub 16-radiato. In India Orientali ad Maradabad. Per.

Trib. II. CHAMÆLOTOS (Lotos, DC. ex parte).

40. *Nymphæa edulis*, DC. Syst. Veg. vol. ii. p. 52, No. 6; ejusd. Prodr. p. 115; Wight et Arnth. Prodr. Fl. Penins. Ind. Orient. p. 447. N. esculenta, Roxbg. Fl. Ind. vol. ii. p. 578, No. 5; ejusd. Icon. in Mus. Soc. Ind. Orient. Lond. et in Mus. Hooker. tab. 660, teste Wight et Arnth. l. c. N. Coteka, Roxb. MSS. cum ic. in Bibl. Banks. (teste DC.) Castalia edulis, Salisb. (V. s. incomp.)

41. *Nymphæa lasiophylla*, Mart. et Zucc.; Abhandl. der Mathem. Physik. Klasse der Bayr. Acad. der Wissenschaft. vol. i. p. 364, No. 31; Mart. Sched. de Nymph. in Itin. Brasiliens. Conscript. No. 2377, MSS. (V. s.)

42. *Nymphæa sagittata*, Edgew. in Trans. Linn. Soc. vol. xv. p. 29, No. 16 (an hujus locis?).

43. *Nymphæa mexicana*, Zucc. Abhandl. der Math. Physik. Klasse der Bayr. Acad. der Wissenschaft. vol. i. p. 365, No. 32. (V. s.)

44. *Nymphæa albo-viridis*, A. de St. Hilaire; Voyage dans le District des Diamans et sur le Littorale du Brésil, vol. ii. p. 426 (an hujus locis?).

45. *Nymphæa Maximiliani*, Lehm. (V. s.) N. foliis membranaceis subpeltatis late ovatis obtusissimis glabris, basi profunde bilobis, lobis ovatis obtusis patentissimis, supra—dum siccis—punctis elevatis minutis sub lente manifestis, subtus dense purpureo-maculatis; calyce tetrasepalo; petalis inæqualibus candidis obtusiusculis; staminibus inappendiculatis inæqualibus, exterioribus basi petaloideis; stigmate sub 12-radiato: radiis elongatis hamato-incurvis. Prope Bahiam (Neuwied). Per.

46. *Nymphæa sagittariæfolia*, Lehm. (V. s.) N. foliis membranaceis sagittatis obtusis glabris saturate viridibus subrepandis, supra—dum siccis—punctis minutis, subtus lineis permultis tenuissimis atropurpureis ubique excurrentibus sub lente manifestis instructis, lobis baseos patentibus acutis; petiolo flaccido in sinu folii, scapo multo graciliore; calyce tetrasepalo; petalis oblongis obtusiusculis calyce brevioribus; staminibus inappendiculatis; stigmate multiradiato; radiis valde elongatis erectis subclavatis. In America centrali (Lehmann). Per.

47. *Nymphæa lineata*, A. de St. Hilaire, Voyage dans le District des Diamans et sur le Littorale du Brésil, vol. ii. p. 425 (an hujus locis?).

48. *Nymphaea amazonum*, Mart. et Zucc.; Abhandl. der Math. Physik. Klasse der Bayr. Acad. der Wissenschaft. vol. i. p. 360, No. 30; Mart. Sched. de Nymph. in Itin. Brasiliens. Conscript. No. 3313, MSS. *N. integrifolia*, Salzmann. *N. foetida*, Gardn. MSS. (V. s.)

49. *Nymphaea Passiflora*, Lehm. (V. s.) *N. foliis submembranaceis subpeltatis rotundato-obtusis basi sagittatis, lobis patentibus acutiusculis, sinu fere triangulari, utrinque viridibus glabris, supra—dum siccis—punctis minutis elevatis sub lente conspicuis; calyce tetrasepalo; petalis inæqualibus acutis albis calyce brevioribus; staminibus radiantibus exterioribus apiculatis longitudine fere petalorum; stigmatibus 16-radiato: radiis longissimis linguæformibus rotundato-obtusis. In Brasilia (Serra d'Estrella) (C. Beyrich); in Parana-gua (Gardner). Per.*

50. *Nymphaea Fenzliana*, Lehm. (V. s.) *N. foliis membranaceis suborbicularibus obtusissimis basi profunde bilobis, lobis obtusiusculis, sinu marginibus arcuatis aperto, supra gramineo-viridibus glabris—dum siccis—punctis minutissimis elevatis sub lente manifestis, sub-tus demum subferrugineis; calyce tetrasepalo; petalis candidis exterioribus acutiusculis reliquis lanceolatis acuminatis; staminibus inap-pendiculatis basi valde dilatatis; stigmatibus 22-24-radiato: radiis adscendentibus valde elongatis clavatis incurvis. San Juan de Nica-ragua. Per.*

Trib. III. CASTALIA.

* Floribus albis (*Leuconymphaea*, Boerh.).

51. *Nymphaea acutiloba*, DC. Prodr. vol. i. p. 116, No. 20; Icon. Plant. in China nasc. e Bibl. Braam. tab. 18 (tab. non inspecta).

52. *Nymphaea odorata*, Ait. Hort. Kew. ed. 1, vol. ii. p. 292; DC. Syst. Veg. vol. ii. p. 57, No. 15; ejusd. Prodr. vol. i. p. 116; Asa Gray, Gen. Plant. Fl. Americ. Boreal-Orient. vol. i. p. 101, tab. 42—

43. *α. orbicularis*. *N. odorata, α.*, Torr. et Gray, *Fl. of North Amer.* vol. i. p. 57. *N. odorata, Andr. Bot. Repos.* vol. v. tab. 297; *Bot. Magaz.* vol. xxi. tab. 819; *Willd. Hort. Berolin.* tab. 39. *N. alba, Michx. Fl.* vol. i. p. 311. *Castalia pudica, Salisb. β. reniformis*. *N. odorata, β.*, Torr. et Gray, *Fl. of North Amer.* l. c. *N. reniformis, Walt. Fl. Car.* p. 155; *DC. Syst. Veg.* vol. ii. p. 55, No. 13; *ejusd. Prodr.* vol. i. p. 115; *Deless. Icon.* vol. ii. tab. 15. *Nelumbium reni-forme, Willd. Spec. Plant.* tom. ii. pars ii. p. 1260. *γ. minor*. *N. odorata, γ.*, Torr. et Gray, *Fl. of North Amer.* l. c. *N. odorata, β. minor, Bot. Magaz.* vol. xl. tab. 1652. *N. odorata, β. rosea, Pursh,*

Fl. Americ. Septenbr. vol. i. p. 369. *N. minor*, DC. *Syst. Veg.* vol. ii. p. 58, No. 16; *ejusd. Prodr.* vol. i. p. 116. (α . et γ . v. v., β . v. s.)

53. *Nymphæa nitida*, Sims in Bot. Magaz. vol. xxxiii. tab. 1359; DC. *Syst. Veg.* vol. ii. p. 58, No. 17 (excl. *Synon. Gmel. et Willd.*); *ejusd. Prodr.* vol. i. p. 116.

54. *Nymphæa blanda*, Meyer, Prim. Fl. Essequib. p. 201; DC. *Syst. Veg.* vol. ii. p. 59, No. 19; *ejusd. Prodr.* vol. i. p. 116. (V. s.)

55. *Nymphæa alba*, L., α . Linn. Spec. Plant. 729; DC. *Syst. Veg.* ii. p. 56, No. 14; *ejusd. Prodr.* vol. i. p. 115; Koch, *Synops. Fl. Germ. et Helv.* ed. 2, p. 29; Gaertn. de Fructib. vol. i. tab. 19; Schkuhr, Handb. vol. ii. tab. 142; Fl. Dan. vol. iv. tab. 602; Engl. Bot. vol. iii. tab. 160; Sevensk. Bot. vol. ii. tab. 92; Hayne, *Arzneigew.* vol. iv. tab. 35; Reichenb. Icon. Fl. Germ. tab. 67; Sturm in Abhandl. der Naturf. Gesell. zu Nürnberg. fasc. i. p. 148, tab. 3, fig. 8—13. *N. splendens*, *urceolata*, *venusta* et *rotundifolia*, Hentze in Mohl et Schlecht. Bot. Zeitg. 1848, p. 603, 699—700 (fide specim. ab ipso auct. benevole mecum communicat.) *Castalia speciosa*, Salisb. † *N. biradiata*, Sommerauer in Regensb. Bot. Zeitg. 1833, No. 40, p. 625; Conf. Observ. Ibid. p. 631; Reichenb. Icon. Fl. Germ. tab. 69; Koch, *Synops.* l. c.; Cons. E. Fries, *Summa Veget. Scandinav.* i. p. 143, et Lehm in E. Otto Hambg. Garten- und Blumenz. viii. p. 369. *N. intermedia*, Weiker in Reichenb. Fl. Saxon. ed. 2, p. 10 (?). *N. erythrocarpa*, Hentze in Mohl. et Schlechtend. Bot. Zeitg. 1852, p. 747. β . *minor*, Bess. Hort. Eystett. Vern. Ord. vii. tab. 3, fig. 2; DC. *Syst. Veg.* vol. ii. p. 56, No. 14; *ejusd. Prodr.* p. 115; Koch, *Synops. Fl. Germ. et Helv.* l. c.; Reichenb. Icon. Fl. Germ. tab. 68 (?). *N. parviflora*, Hentze in Mohl et Schlecht. Bot. Zeitg. 1848, l. c. (?). (V. v.)

56. *Nymphæa basniniana*, Turczan. Fl. Baical. Davur. No. 84; Ledeb. Fl. Ross. vol. ii. p. 743. (V. s.)

57. *Nymphæa pauciradiata*, Bunge in Ledeb. Fl. Alt. vol. ii. p. 272; Ledeb. Fl. Ross. vol. i. p. 84. (V. s.)

58. *Nymphæa semiaperta*, Klinggræff, Fl. von Preuss. p. 20; Sturm in Abhandl. der Naturf. Gesell. zu Nürnberg. fasc. i. p. 143, tab. 3, fig. 1—7; Conf. Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 369. *N. neglecta*, Hausleutn. in Mohl et Schlechtend. Bot. Zeit. 1850, p. 905, 1852, p. 421. (V. v.)

59. *Nymphæa candida*, Presl, Del. Pragens. p. 224; Koch, *Synops. Fl. Germ. et Helv.* ed. 2, p. 29; Reichenb. Icon. Fl. Germ. tab. 70.

60. *Nymphæa Kosteletzkyyi*, Palliardi; Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 369. (V. v.)

61. *Nymphæa cachemiriana*, Jacquemt. Voy. dans l'Inde, vol. iv. p. 11, tab. 10.

62. *Nymphæa punctata*, Kar. et Kir. Enumerat. Plant. Fl. Alt. No. 50; Ledeb. Fl. Ross. vol. i. p. 743.

63. *Nymphæa pygmæa*, Ait. Hort. Kew. ed. alt. vol. iii. p. 293; Bot. Magaz. vol. xxxviii. tab. 1525; D.C. Syst. Veg. vol. iii. p. 58, No. 18; ejusd. Prodr. p. 116. *N. tetragona*, *Georgi Iter*, vol. i. p. 220; *N. alba minor*, *Gmel. Fl. Sibir.* vol. iv. tab. 71. *Castalia pygmæa*, *Salisb. Par. Lond.* tab. 68 (*ex DC.*) (V. s.)

** Floribus cæruleis.

64. *Nymphæa violacea*, Lehm. (V. s.) *N. foliis coriaceis subovatis repandis cordato-bilobis, lobis obtusis, sinu marginibus arcuatis extrorsum aperto, glabris supra flavescenti-viridibus—dum siccis—punctis elevatis minutissimis sub lente manifestis, subtus saturate purpureis; calyce tetrasepalo; petalis saturate violaceis exterioribus majoribus obovato-oblongis; staminibus inappendiculatis numerosissimis stigma sub 10-radiatim totum tegentibus. β. cærulea, floribus majoribus et petalis angustioribus. In Nova Hollandia Boreali collegit α. J. Anderson; α. et β. Cape York (J. Macgillivray). Per.*

Quid *N. crenulata*, *Rafinesq.*; *Schmaltz. in Med. Repos. of New York*, vol. v. (nomen) *ex Desvaux, Journ. de Botanique*, vol. ii. p. 173?

NOTICES OF NEW BOOKS, &c.

'*The Annals and Magazine of Natural History*,' No. 65, May, 1853.

The botanical papers in this number are intitled:—

'On the Occurrence of Palms and Bambus [Bamboos] with Pines and other Forms considered Northern at considerable elevations on the Himalaya; by Major Madden, H.E.I.C.S., F.R.S.E., M.R. Dublin Society.'

'Remarks upon British Plants; by Charles C. Babington, M.A., F.R.S., F.L.S., &c.'

'On the Genera of the Tribe Duboisæ; by John Miers, Esq., F.R.S., F.L.S.'

'On the Nervures of Leaves and their Distribution; by L. von

Buch.' [Extracted from the Bibl. Univ. de Genève, Oct. 1852, p. 161.]

Mr. Babington's paper is continued from the April number, and contains valuable remarks on certain species of *Hypericum*, *Agrimonia*, and *Matricaria*.

Hypericum.

It will be recollected that a second species of that division of *Hypericum* called *Androsæmum* by some authors, has been introduced into the British Flora, under the name of *H. grandifolium*, *Chois.* Such is the case in Mr. Babington's 'Manual,' in which it is recorded as "stated, doubtless erroneously, to grow in Arran, Scotland." The species is a native of the Azores; and it seems strange that it should re-appear in Scotland, when absent from the climatically intermediate countries. Bertolini, in his recently-published fasciculus, vol. viii. fasc. 3, includes the supposed Arran plant, indeed the whole of the supposed species, *Hypericum grandifolium* of Reichenbach (*Icon. Fl. Germ.* vi. 70, t. 352), under the name of *Hypericum anglicum*; but, unfortunately, as it appears to us, quotes Curtis' figure (*Fl. Lond.* i. t. 164), as representing his plant. Now, that figure certainly represents, and with very considerable fidelity, the *Hypericum Androsæmum* of Linneus. Still, there is a larger, and, as Mr. Babington thinks, a distinct, plant, first gathered by Dr. Balfour at Glanmire, near Cork, in great abundance, and apparently wild: this plant is supposed to be the *H. anglicum* of Bertolini. Amended characters of *H. Androsæmum*, *H. anglicum*, and *H. hircinum* of Linneus, an allied European species, are given as below:—

"1. *H. Androsæmum* (Linn.); stem shrubby compressed, leaves broadly subcordate-ovate blunt, cymes few-flowered, sepals broad unequal, *styles falling much short of the stamens, capsules pulpy blunt.*

"*H. Androsæmum*, Linn. *Sp. Pl.* 1102, et *Auct.*

"2. *H. anglicum* (Bert. ?); stem shrubby 2-edged much branched, pedicels 2-winged, *leaves broadly cordate-ovate acuminate*, cymes few-flowered, sepals ovate-lanceolate unequal, *styles equalling or exceeding the stamens, capsules oblong acute.*

"*H. anglicum*, Bert. *Fl. Ital.* viii. 310 ?

"*H. Androsæmum*, Eng. *Bot.* t. 1225.

"*H. hircinum* (Linn.); stem shrubby 2-edged much branched, pedicels 2-winged, *leaves ovate-oblong*, cymes few-flowered, sepals lanceolate unequal, styles equalling or exceeding the stamens, capsules oblong acute.

"*H. hircinum*, *Linn. Sp. Pl.* 1103 et *Auct.*"

As an observation, perhaps not altogether out of place, I may remark that the St. John's-worts of the division called *Androsæmum* are great favourites in Ireland. No flowering plants are more common in cultivation; none more hardy; and none, as it appears to me, more given to escape, and to ornament the hedge-banks in the vicinity of towns, the only locality in which Irish hedge-banks can be said to exist. It is almost impossible for the traveller not to be struck with the frequency and beauty of these plants in such situations. I do not feel quite so sure that such apparent escapes, after perhaps half a century's cultivation in a very fertile soil, can safely be regarded as having any very strong claim on the botanist's attention. Their original source is lost in obscurity; and their clinging to the confines of cultivation with vigorous pertinacity, and assuming a wild and natural character, is scarcely conclusive evidence of an indigenous origin. The same observation applies to *Hypericum calycinum*, so luxuriantly and abundantly naturalized in the vicinity of Killarney, and other Irish localities.

Agrimonia.

Agrimonia odorata, *Mill.*, introduced into the British Flora on the faith of specimens found by the Rev. W. W. Newbould, in the Island of Jersey, in 1842, was subsequently found by Mr. Babington, in company with that gentleman, on the rocky shore of Lough Neagh, in the North of Ireland, and again by Mr. Joseph Woods, near Start Point, in Devonshire, and near Gwithian, in Cornwall. It may therefore be now fairly received as geographically a British plant; its occurrence in the Channel Islands giving it a political claim only. The italicized words in the following character serve to distinguish it from *A. Eupatoria*:—

"*A. odorata* (Mill.); leaves interruptedly pinnate coarsely serrate hairy and with many minute glands beneath, calyx-tube of the fruit *bell-shaped not furrowed*, exterior spines of the fruit declining.

"*A. odorata*, *Mill. Dict.* n. 3; *Koch, Syn.* 245; *Mert. et Koch, Deutschl. Fl.* iii. 376; *De Cand. Prod.* ii. 587? *C. A. Mey.*

' *Bull. St. Pet.* x. 344,' and *Ann. Soc. Nat.* ser. 2, xviii. 375 ;
Guss. Syn. i. 527 ; *Ledeb. Fl. Ross.* ii. 31.

" *A. procera*, *Wallr. in Linnæa*, xiv. 573."

Matricaria.

Mr. Babington attempts, with great ingenuity, to lay down characters whereby the species *M. inodora* and *M. maritima* may be distinguished. The subject appears to be one of very considerable difficulty ; and British botanists have great reason to thank Mr. Babington for the pains he has taken. Indeed, in this as in all other instances, this excellent botanist investigates the question before him with the utmost care ; and although some may doubt the conclusions at which he occasionally arrives, the zeal, industry, ability, and great knowledge which he brings to bear on every subject under investigation, must be patent to all.

The following are the characters of the species now under consideration :—

- " 1. *M. inodora* (Linn.) ; st. erect, leaves sessile pinnate, leaflets with many usually alternate capillary pointed segments, basal leaflets crowded clasping the stem not separated from the others, heads solitary, phyllaries lanceolate blunt with a fuscous scarious torn margin, fruit with two glandular spots just below the elevated border.
- " *M. inodora*, *Linn. Fl. Suec.* ed. 2, 297 ; *De Cand. Prod.* vi. 52 ; *Fries, Mant.* iii. 115 ; *Hook. and Arn. Brit. Fl.* 242 ; *Gren. et Godr. Fl. Fr.* ii. 149 ; *Lloyd, Fl. Loir-inf.* 139.
- " *Chrysanthemum inodorum*, *Linn. Sp. Pl.* ed. 3, 1253 ; *Koch, Syn.* ed. 2, 419.
- " *Pyrethrum inodorum*, *Sm. Fl. Brit.* ii. 900, and *Eng. Fl.* iii. 452 ; *Eng. Bot.* t. 676.
- " *Tripleurospermum inodorum*, *C. H. Schultz ex Koch, Syn.* ed. 2, 1026 ; *Walp. Rep.* vi. 196.
- " *Chamæmelum inodorum* annum humilius, foliis obscure virentibus, *Dill. in Raii Syn.* ed. 3, 186.
- " β. *salina* ; stem more diffuse often nearly prostrate, leaflets short fleshy, involucre umbilicate, disk broader, fruit with only the one external rough space and oblong glandular spots.
- " *M. maritima*, *Linn. Herb.* ! *Gren. et Godr. Fl. Fr.* ii. 149 (excl. syn.)
- " *Pyrethrum inodorum* β. *salinum*, *Wallr. Sched. Crit.* 485.

- "*Pyrethrum maritimum*, *Sm. Fl. Br.* ii. 901, and *Eng. Fl.* iii. 452 ;
Eng. Bot. t. 979 ; *Wilson in Hook. Journ. of Bot.* i. 271.
 "Tripleurospermum maritimum, *Kach, Syn.* ed. 2, 1026 ?
 "2. *M. maritima* (Linn.) ; stem diffuse, leaves pinnate, leaflets and
 segments opposite fleshy linear bluntish short, basal leaflets
 few small separated from the others, heads solitary, phyllaries
 oblong blunt with a scarious (pale) entire margin, fruit with two
 elongated glandular spots just below the elevated lobed border.
 " *M. maritima*, *Linn. Sp. Pl.* ed. 1, 891, ed. 3, 1256 ; *Fries, Mant.*
 iii. 115, et *Summa*, 186, et *Herb. Normale*, xii. 2 !
 " *Chamæmelum maritimum* perenne humilius, foliis brevibus cras-
 sis, obscure virentibus, *Dill. in Raii Syn.* ed. 3, 186, t. 7, f.
 1 ; *Linn. Iter. w. Goth.* 148."

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-fifth Sitting.—Saturday, May 28, 1853.

MR. NEWMAN, President, in the chair.

The President read the following communications :—

Hermaphrodite Florets in Salix caprea.

"Amongst my specimens of this species, is a flowering branch, gathered in 1847, on the banks of the Ouse, between York and Acomb, which appears to deserve notice, as exhibiting amongst its catkins a gradual transition from staminate to pistillate inflorescence. The former occurs most plentifully in those situated about the summit of the stem, especially towards their apices ; whilst normal pistils are confined to the base of the lowest catkin. The scales remain unaltered throughout, and are as in the ordinary state of the species. Between the extreme conditions of the essential portion of the flowers, four principal intermediate stages may be traced, leaving out numerous minor gradations.

"1. Filament as in the normal stamen ; anthers smaller, placed upon a dilated connective, which is slightly produced beyond them, like a beak.

"2. Filament shorter, stouter, slightly silky; connective transformed into a cernuous ovarium-like body, shaped like the capsule of some of the Hypna, with faint traces of anthers upon its sides; beak dilated into the resemblance of a stigma.

"3. Stalk filament-like; ovary narrowly lanceolate, gray, silky, curved; stigma sessile, irregular, but viscid.

"4. Stalk rather longer than in the normal pistil; ovary gray, silky, flask-shaped; style very short; stigmas perfect, somewhat emarginate."—*John G. Baker; Thirsk, near Yorkshire, May 7, 1853.*

Rubus latifolius, Bab.

"Whilst Rubi are under consideration, perhaps I may be allowed to suggest the idea that this supposed new species, described in the third edition of the 'Manual,' is a luxuriantly-developed form of *R. corylifolius*, bearing the same relation to the type that var. *pseudo-Idæus* bears to *R. cæsius*, or *R. Borreri*, *Bell-Salter*, to *R. Sprengelii*, *Weihe* (see Phytol. iv. 917, 918). It is recorded in the Supplement to the 'Cybele' as a native of the Humber province, on faith of specimens collected in the hedges between Thirsk and the village of Thorpfield; so that I have had an excellent opportunity for studying it in a growing state. In the extreme form, in this neighbourhood, it is a large, coarse-looking bramble, rivalling *R. Balfourianus* or *R. macroacanthus* in size, with a thick, furrowed, and angular barren stem, green in the shade, but purplish and glabrous, like that of the *Nitidi*, when exposed. The leaflets are exceedingly dilated, and consequently much imbricated; the terminal one rotundato-cordate, acuminate, even occasionally broader than long, and pilose beneath, as described. But gradually and imperceptibly, as we pass along, the stem becomes more slender and less angular, the prickles smaller, and the leaflets narrower and thicker in texture; and without any abrupt transition we arrive at the '*conjungens*' form of *R. corylifolius*; this, again, gliding into the type of the species, with its characteristic, round, and slightly setose stem, slender and somewhat irregular prickles, and leaves whitish and tomentose below."—*Id.*

Rubi in the North of England.

"Probably nearly all the fruticose forms will be found to extend their range to the north of the Humber; thirty out of thirty-eight species described in the third edition of the 'Manual' having already been detected by very imperfect research. In North Yorkshire, the commoner species, arranged in their order of frequency, are discolor,

cæsius, corylifolius, pallidus, tenuiarmatus, *Lees*, rhamnifolius, leucostachys, fusco-ater, mucronatus, Koehleri, nitidus, and rudis. The rarer are suberectus, plicatus, affinis, thyrsoides, carpinifolius, villi-caulis, macrophyllus, Sprengelii, fuscus, Babingtonii, hystrix, Guntheri, glandulosus (Bellardi and rosaceus), and nemorosus. The thyrsifloral form of *R. Guntheri* (*R. thyrsiflorus*, *Lees in Steele's Handbook*) occurs, with the type of the species, amongst the rocks above Gormire. In this latitude, the fruticose species cease to become plentiful, in exposed positions, at 800 or 900 feet, though stragglers may occur much higher. They are replaced, in more elevated situations, by *R. saxatilis*, and, on the boggy surface of the higher moors, by *R. Chamæmorus*."—*Id.*

Polygala uliginosa, Reich.

"In the last number of the 'Phytologist' (iv. 940), this recent addition to our lists is incidentally mentioned as having been discovered in Scotland. The only locality yet ascertained is on heathy ground along the margin of the rivulet behind Cronkley Fell, in the Yorkshire portion of Upper Teesdale, at an elevation of about 1600 feet, more or less."—*Id.*

Worcestershire Species of Lepidium.

"All the British species of *Lepidium* are now found near Worcester, although Purton, in 1821, records only one in the midland counties, viz., *L. campestre*, which is still the only common species in this neighbourhood. *L. ruderale*, however, had been mentioned by Withering, in 1787, on the authority of Dr. Stokes, as growing upon 'rubbish on the side of the Severn above Worcester;' and during the last few years it has been observed in three other places, to the north of the city. Last autumn, it was very abundant in a lane near St. Peter's Church, Droitwich, in the locality where I discovered it two years ago, on rather elevated ground, in company with *Spergularia marina*, *Poa distans*, *Glaux maritima*, and other maritime plants. *L. Smithii*, though rare, is occasionally met with near Mavern and Worcester. *L. Draba* maintains its singular position at the Powick-bridge embankment, on the Malvern road, where it was first discovered in 1843, by E. Lees, Esq., who has contributed more than any other individual towards the advancement of our knowledge of Worcestershire plants. *L. sativum* is occasionally met with about Worcester, and elsewhere in the county; and it seems pretty well naturalized, though doubtless a garden-escape. Last October, I had

the pleasure of adding to the Worcestershire Flora, *L. latifolium*, which I found close to the river Salwarp, where it is crossed by the Wolverhampton Railway, near Droitwich. I first saw some patches of it on the recently-formed railway embankment; but on further examination I detected some old plants in a muddy place by the river-side, where, perhaps, they have been growing secluded and unnoticed for a long time. *L. latifolium* is not quite unknown in this western part of the island; for I met with it last July, in some quantity, near Britton Ferry, in Glamorganshire, where it has been observed for years. But I am not aware of its having been recorded as an inland plant; and it is further interesting as another addition to the score of salt-marsh plants which now flourish in the Salwarp Valley, perhaps the relics of an ancient marine vegetation, as Professor Buckman suggests in his 'Ancient Straits of Malvern.'—*J. H. Thompson, B.A. ; St. Nicholas, Worcester, May 4, 1853.*

Epilobium virgatum.

"Mr. Syme having intimated his belief (Phytol. iv. 933) that the plant sent by me to the Botanical Society as *Epilobium virgatum* should rather have been labelled *E. Lamyi*, it may perhaps be satisfactory to the members to know that I used that name on Mr. Babington's authority, having submitted specimens of the Herefordshire plant to him. It is thus undoubtedly the *E. virgatum* of the 'Manual,' and, as it appears to me, of continental botanists also; seeing that *E. Lamyi* is stated by Godron, in the 'Flore de France,' to have no stolons; while in many of the examples I sent to the Society they are three or four inches long, as is stated to be the case in *E. virgatum*. I have a specimen with broad-based, decurrent leaves, and no stolons, gathered in Kincardineshire, by Mr. Syme, in 1850, and sent to me by the Botanical Society, as *E. virgatum*. This specimen Mr. Babington pronounced *E. tetragonum*; and if it is identical with the Scotch plant spoken of by Mr. Syme, the cause of our different nomenclature is at once apparent. Mr. Babington's *E. tetragonum* is so scarce in this neighbourhood, that I have not been able to study it sufficiently to warrant me in expressing any opinion as to the constancy of its differences from *E. virgatum*."—*W. H. Purchas ; Ross, May 21, 1853.*

Remarks upon Polystichum aculeatum.

"A very general opinion prevails that *Polystichum angulare*, and *P. Lonchitis* are connected together by a series of forms of *P. aculeatum*,

scarcely differing from them at the two extremes, or from each other in their intermediate links. I have paid considerable attention to *P. aculeatum* and its supposed varieties for upwards of ten years; and I now believe that the plant has no constant variety whatever.

"In the month of May, 1842, I took up a plant of this species in the neighbourhood of Egham. It had fronds about a foot long, and was a good representation of what botanists call var. *lobatum*. This was planted in a bed of bog-soil, which had been purposely prepared for ferns, in a rather exposed situation. It kept its character (or, rather, retrograded) for three years. In 1845, the whole of the ferns in this bed were removed to another place, where the natural soil was light, the subsoil gravel, and the situation shady. Here our plant soon found itself at home, and in three years attained as high a state of development as I have ever observed in any plant of this species; it then became stationary, and remains so up to the present time. I have now before me a frond of it, of last year's growth, nearly three feet long by somewhat more than six inches broad. The pinnules are distinctly stalked for more than two-thirds of the length of the pinnæ. In this state, it comes near to *P. angulare*, but differs from that species in its more rigid texture, narrower outline of frond, more crowded pinnæ, more acute, strictly serrate pinnules, and in its never becoming subtripinnate, which fronds of *P. angulare*, of two feet long or more, invariably do. I have observed another difference between these plants, which (to the best of my knowledge) has not been recorded by any botanist. *P. angulare* is very proliferous, producing lateral crowns freely; whereas *P. aculeatum* never does, except when its crown gets destroyed by accident, and then it will. In the spring of 1852, I took up a plant with four crowns, in various stages of development, from *lonchitidioides* to *lobatum*. Near as these two species are to each other, there are two acknowledged species between them, or, rather, placed opposite to their point of junction; I mean *P. pungens* and *P. proliferum*. Both are as rigid as *P. lonchitis*; and whilst the former has the broad, subtripinnate frond of *P. angulare*, the latter has the narrower frond and decurrent lobes of *P. aculeatum*; it is, also, viviparous near the apex of the frond, but not constantly so.

"Nine years since, I collected about a dozen plants upon a dry bank. They could scarcely be called more than pinnate; and I thought I had got var. *lonchitidioides*. One of these I potted, and kept in a greenhouse; and in three years it came to the same state of development as the plant first mentioned was when I first saw it.

I then turned it into a border, with other ferns, and kept it two more years; and it still kept getting nearer to its full state of development.

"I think that the above examples are sufficient to trace this species in its transition from its young state to its full development; but they are only two amongst many.

"If a young plant of this species is planted in an unfavourable situation, it will remain stationary for years, or perhaps get less divided than when first planted, but will always advance if properly treated. In its wild state, it is very generally distributed, and may probably be found in every English county. It appears to like a loamy, or even a clay, soil; its favourite situation is a steep bank in a shady lane; and it is generally associated with *P. angulare*, and often with *Scolopendrium vulgare* also. It does not transplant from its wild state so well as its congener, being not so tufted, and more wiry, as well as longer in its roots. When it has established itself under cultivation, that character is not so easily observed; but it is very apparent in removing wild plants.

"It may be mentioned, with respect to its distribution in the vicinity of London, that in Surrey you seldom meet with many plants together, and that it is much scarcer than *P. angulare*; whilst on the opposite side of the Thames, in Middlesex, and particularly in Buckinghamshire, it is by far the most plentiful plant; and in Kent and Sussex the two appear to be about equal.

"I inclose the frond first mentioned; a frond from the same plant ten years ago; a small frond from the plant with four crowns, which were produced since it was transplanted in May, 1852; and the plant itself, taken up and dried, showing the old caudex and young crowns; so that any one who examines them may judge for himself. They are very unlike each other, and amply confirm Mr. Newman's observation that this is a protean fern."—*John Lloyd; Wandsworth.*

Gymnogramma leptophylla in Jersey.

The President observed that he had received several communications respecting the occurrence of *Gymnogramma leptophylla* in Jersey. All those from the island represent this fern as widely distributed, growing on the banks of exposed lanes having a southern aspect, more especially in those localities in which the moistened soil induces the growth of *Marchantia*, in the company of which plant it appears particularly to flourish; it also occurs, but not so frequently, growing in moss. The principal localities are near St. Haule, near

St. Aubin's, and in several places near St. Lawrence. In one spot near the last-named place, it grows plentifully for a very considerable distance along a hedge-bank, extending as far as the bank is exposed, but ceasing exactly where the lane is shaded by trees. The accounts tend to establish the plant as a true native of the island, and to remove the idea of its intentional introduction.

Pseudathyrium alpestre, and an allied Species.

The President observed that since he had the pleasure of inviting attention to the occurrence, in Scotland, of a fern previously unrecorded as British, several very ardent and most acute botanists had searched the districts indicated, and with complete success. The result, however, was the discovery of, not a *single* species alone, but of two. Through the kindness of Mr. Backhouse, he had had the opportunity of examining an extensive and very beautiful series of each of these; and although in this early stage of the inquiry he by no means wished to do more than indicate the more obvious distinguishing characters, he considered it due to his friends to communicate to the public the result of their researches.

P. alpestre. Habit *rigid*. Frond *lanceolate, suberect*, 2-3 feet long, bipinnate; pinnæ *ascending*, distant near the base, *elsewhere crowded*, subacute; pinnules 25-35 on each side of midrib of pinna, *wider* at base, *crowded*, toothed; clusters of capsules 25 or more on each pinnule, *crowded, finally confluent*.

Hab. "Canlochen Glen, Forfarshire," "Ben Aulder," "Mountains near Dalwhinnie," *H. C. Watson*. "Lochnagar," "Head of Glen Prosen, Clova mountains, Forfarshire," "Ravine of the White Water, Clova mountains, Forfarshire," "Glen Fiahd, Clova mountains," *James Backhouse, James Backhouse, junr., Thomas Westcombe*.

P. flexile. Habit *lax, flexile* Frond *strap-shaped*, spreading horizontally, 8-18 inches long, bipinnate; pinnæ *distant throughout, horizontal or drooping*, subobtusate; pinnules 7-10 on each side of midrib of pinna, *narrower at base, distant*, subobtusate, serrated; clusters of capsules 6-8 on each pinnule, *distant, always separate*.

Hab. "Micaceous rocks at the head of Glen Prosen, Clova mountains, Forfarshire," *James Backhouse, James Backhouse, junr., Thomas Westcombe*.

The generic characters assigned to *Pseudathyrium* will require revision. From an examination of fronds of "*P. alpestre*" in a living state, it seems that the clusters of capsules first make their appearance with a crescentic margin of attachment, somewhat as in *Athyrium Filix-fœmina*; and that there exists occasionally a rudimentary involucre scale. The same crescentic margin of attachment has been observed by Mr. Backhouse in the cultivated living frond of the plant now called "*P. flexile*." The specific characters will also require remodelling; and a rigid investigation of the synonymy is absolutely necessary, the names now proposed being provisional only, the latter, more especially, being likely to be superseded by a prior specific name.

THE PHYTOLOGICAL CLUB,
(*In connexion with the Pharmaceutical Society*).

May 2, 1853.—Robert Bentley, Esq., F.L.S., &c., President, in the chair.

Several new members joined the Club.

Mr. D. Hanbury exhibited the following specimens:—

1. Ravensara nuts, produce of *Agathophyllum aromaticum*, a tree of Madagascar, where they are used as a spice, and whence they have occasionally been brought to France.
2. *Casca pretiosa*, the bark of *Mespilodaphne pretiosa*, a native of Brazil. It is highly valued as an aromatic. It belongs to the natural order Laurinææ.

Worcester Branch of the Club.

The Secretary presented a report of a meeting of the members of the Club, resident at Worcester, held April 22, when the "*Worcester Branch of the Phytological Club*" was formed. A few simple rules were adopted, providing for periodical meetings, herborizing excursions, the formation of a local herbarium of plants found in the county, &c. A standing note was appended to the Rules, to the effect that members be exhorted to be particularly observant of Professor Bentley's truthful remarks on the destruction of habitats for scarce plants, *viz.*, never to allow their love of *collecting* to supersede their love of *Botany*. Considering the assistance that more experienced botanists of the neighbourhood could give in the formation of a county herba-

rium, it was resolved "that Edwin Lees, Esq., F.L.S., the Rev. J. H. Thompson, and T. Westcombe, Esq., be invited to become Honorary Members." The commencement of a library was proposed; and a few books were presented for this object. Mr. J. S. Walker, Mr. Baxter, and Mr. T. W. Gissing were appointed the Committee; Mr. Walker to be Chairman; and Mr. Gissing, Secretary.

Uses of Ferns.

The Secretary read a letter from E. Newman, Esq., F.L.S., &c., asking information upon the *uses* of ferns throughout the country, for the forthcoming edition of his 'British Ferns.'

Mr. Newman inquires:—

"1st. Are there any species of British ferns used in medicine?

"2nd. Which *species*, and under what *names*? On this subject, three provincial chemists have assured me that *Polypodium vulgare* of botanists is the *P. Filix-mas* of pharmacy; and I have verified this nomenclature in one instance.

"3rd. Whether the use of ferns in medicine is founded on their ascertained properties, or on ancient predilections?

"4th. Whether the use is increasing or decreasing?

"This and all other information connected with British ferns will be most thankfully received by yours, most truly,

"Edward Newman."

The President hoped that the queries just read would elicit the response they deserved. A wide field of usefulness lay open to the Club, in collecting statistics of the popular employment of native plants in different parts of the country. Mr. Newman's second query showed that confusion of species had in some instances occurred. However, the true *Lastrea Filix-mas* was certainly in use.

Two or three members spoke of the employment of *Ophioglossum vulgatum* for the preparation of a very popular ointment, in the counties of Essex, Herts, and Devon, from their personal knowledge.

A letter was also read from Dr. William Lauder Lindsay, F.B.S.E., &c., of Edinburgh, who wished to obtain co-operation in an investigation of the lichens, which he had undertaken. The letter was accompanied by a *resumé* of the points upon which information was desired.

Ergotism of Grasses.

Mr. Blyth drew attention to the subject of the ergotism of grasses. During the summer of last year, he had observed its prevalence amongst every species of grass, in certain localities. These were upon a heavy clay soil, and on the shady sides of hedges.

It would be remembered that the cold and dry spring, which retarded vegetation, was succeeded by heavy rains at the period of inflorescence of the cereals, and then by intense heat.

Specimens of ergot, collected from a number of grasses, were placed on the table. Some of the same sample had been employed by Dr. Tyler Smith, at St. Mary's Hospital, and had proved far more efficient than the ergot of rye. The question of its substitution was therefore one of much interest; and it was most desirable that any opportunities for its collection should be embraced, in order to place in the hands of the medical profession a supply for further examination.

The influences upon which the disease depended were still a contested subject; and it was to be hoped that the simultaneous observations of pharmacutists in different parts of the country, during the ensuing season, would assist in clearing up some points involved.

It would be important to notice the character of the soil, the temperature of the air, the amount of rain, and the periods of vegetation at which it had fallen; also whether sunshine had prevailed.*

Substitute for Tea, &c.

The President exhibited some specimens received from Capt. Kennedy, late commander of the 'Prince Albert,' one of the vessels engaged in the search after Sir John Franklin.

Firstly, the dried flowers, with a few leaves, of *Ledum palustre* (Ericaceæ), employed extensively as a substitute for tea, in various parts of North America. The plant in question is commonly called narrow-leaved Labrador tea, and is an inhabitant of the colder part of Canada, the coasts of Newfoundland and Labrador, and the whole of Rupert's Land to the Arctic Sea, on whose shores it grows, from Repulse Bay to Kotzebue Sound. According to Dr. Asa Gray, it is not found South of the United States boundary-line. This plant was formerly found on the north-west coast of Ireland, and used to be included in

* An excellent popular account of the subject will be found in a little book entitled 'Blights in the Wheat,' by the Rev. E. Sydney. Religious Tract Society.

the lists of the British Flora ; but it is now very properly omitted, as having no claim to be considered native. An infusion of the flowers and leaves possessed an astringent, bitter flavour, and a strong, somewhat aromatic odour. It certainly appeared to produce a slight narcotic effect, which is not surprising, when its alliance to the Rhododendrons, Kalmnia, Azalea, &c., all possessing poisonous narcotic qualities, is considered. The leaves are stated to be used in the preparation of beer, which they render extremely heady. Two other plants of the same natural order, *Gualtheria procumbens* and *Rhododendron Lapponicum*, are in use in North America as substitutes for tea.

Pemican, an article of Arctic diet, composed of buffalo-meat mixed with marrow and the fruit of some tree, was introduced on account of the latter ingredient. This fruit is a small, black pome, nearly agreeing with the Zante currant in size and flavour. Sir J. Richardson, in his 'Journal of a Boat Voyage through Rupert's Land,' states that two fruits are used for mixing with pemican, *viz.*, choke-berry (*Cerasus Virginiana*) and shad-berry, or service-berry (*Amelanchier Canadensis*). The fruits, then, under consideration, were evidently derived from the last-named.

Medicinal Lobelia, from Peru.

Mr. D. Hanbury read the following paper, 'On a Variety of Lobelia, from Peru, having Medicinal Properties,' by Mr. Penney, who was unavoidably absent :—

"A few weeks since, Mr. Daniel Hanbury handed me a specimen of Lobelia, which he had received from Mr. A. J. de Warszewicz, a German botanist, travelling in South America. It was found near the village of Jarobamba, five leagues from Arequipa, in the district of Canchumja, Peru. It is evidently a Lobelia, agreeing in its characters with that genus. A monopetalous, epigynous exogen, with a two-celled ovary, syngenesious anthers, stigma surrounded by hairs, and valvate, irregular corolla, it is at once recognized as belonging to the family Lobeliaceæ. I have carefully examined it, and compared its characters with De Candolle's description of the Lobeliæ, and have no doubt of its being the Lobelia decurrens, var. β , of that author, described in his 'Prodromus,' part vii. p. 384. The L. decurrens is described and figured by Cavanilles, in his 'Icones et Descriptiones Plantarum quæ aut sponte in Hispania crescunt aut in hortis hospitantur,' tom. vi. p. 13, t. 521 ; also in the Bot. Reg. vol. xxii. tab. 1842.

"This variety, under the name of *Lobelia foliosa*, was noticed by Bonpland in 1808. It agreed with Cavanilles' plate, except that the lobes of the calyx and the tube of the corolla are externally pubescent: the leaves and the lobes of the calyx and corolla are very similar. It is described in the *Nova Genera et Species Plantarum Americanarum* of A. Bonpland, A. de Humboldt, and C. S. Kunth, tom. iii. p. 242. Cavanilles and De Candolles both give the habitat of the *L. decurrens* in Chili, on the banks of the river Claro. Kunth says this variety grows in Quito, near the village of Guancabamba. Bonpland gives Peru as its habitat. Mr. de Warszewicz states that it grows on the river Arequipa. These two varieties are included, but not described, by Presl, in his '*Prodromus Monographiæ Lobeliacearum*,' p. 24, under the names *Rapuntium decurrens* et *foliosum*.

"Like other Lobeliaceous plants, this plant is very acrid; its aqueous infusion has a burning, acrid taste, not unlike tobacco; and its smell is irritating and nauseating. It is used as a medicine by the natives of Peru. Mr. de Warszewicz says that its action is very remarkable in nervous fever; that the leaves and flowers, given at Arequipa in the form of powder, in the dose of one, two, or three grains to adults, are found quickly to change the symptoms of the patient; that it is very active as an emetic and purgative; and that the Indians universally employ it as an emetic. He thinks it might be used here as a substitute for *Ipecacuanha*. The roots, which are from four to eight feet in length, are used as well as the flowers and leaves. Mr. de W. is very desirous that its effects should be tried in this country, and hopes that it may prove a more important addition to the *Materia Medica* than the *L. syphilitica*. He says that it may be obtained in large quantities from Mr. Harmson, of Arequipa."

Mr. J. J. Muskett read an interesting paper '*On the Phytology of the Middle Ages*,' referring more especially to superstitions attaching to plants, and to the adaptation of vegetable forms to architecture and heraldry. The essay was illustrated by numerous drawings, rubbings of monumental crosses, &c.—*R. R.*

Obituary.—Died, at Leipzig, on the 2nd of May, Professor Dr. Ch. F. Schwaegrichen, the Nestor of Muscology.—*Bonplandia*:

Botanical News.—Italy.

Florence, April 24.—The reports and documents relating to the Horticultural Exhibition that took place in Florence, in September last (see Bonpl. vol. i. p. 43), have been published; also a Prospectus of the Horticultural Society which those who got up the exhibition hope to be able to form. The seat of the Society is to be in Florence; and to become a member it is necessary to take one share or more, of three francesconi (13s. 4d.) a year each, and, moreover, to pay an entrance-fee of one francesconi. Two hundred shares have already been disposed of.

We have received two new memoirs by M. Gasparrini, published in the 'Transactions of the Academy of Naples.' The one is a 'Revisio Generis Trigonellæ.' The author raises the sections established by Seringe, in De Candolle's 'Prodromus,' to the rank of genera, under the names of *Grammocarpus*, *Ser.*, *Xiphostylis* (*Fœnum græcum*, *Tourn.*), *Falcatula*, *Brot.*; the name of *Trigonella* being retained for the section *Buceras*, *Ser.* The other memoir contains now observations on the fecundation and embryo of *Cytinus Hypocistis*,—a subject investigated by the author eight years ago, and concerning which he now expresses an opinion decidedly opposed to Schleiden's theory on fecundation. According to him, the embryo of this plant is not derived from the transformation of the extremity of the pollentube, but, on the contrary, from one or more vesicle of the summit of the internal nucleus (or sac of the embryo), which are developed before fecundation. Prof. Tenore has written a dissertation on some trees mentioned by the writers of the middle ages, such as the *Arbor vitæ* (*Thuya orientalis*), the balsam-tree (*Amyris Opobalsamum*), the dry-tree (*Platanus orientalis*), the tree of the sun and the moon (*Cupressus sempervirens*), &c. Prof. Massalongo, of Verona, has published an enumeration of the miocene fossil plants hitherto known in Italy; they are sixty-two in number. According to the author, the number of species belonging to the Italian fossil Flora amounts to nearly 1000.

Mr. Webb returned from Rome to Florence a few days ago. Prof. Joseph Bertoloni was also on a visit here a short time ago, for the purpose of studying the plants sent him from the coast of Mozambique, especially those distinguished by useful or otherwise remarkable properties.—*Bonplandia*.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-sixth Sitting.—Saturday, June 25, 1853.

MR. NEWMAN, President, in the chair.

The President read the following communications :—

Potamogeton flabellatus, Bab.

“On the 30th of May last, I found this plant in a fen-ditch near Nordelph, Norfolk. This may be worth recording, as the plant is very little known, although probably not very uncommon. No botanist, who has examined and compared the earlier leaves of this plant and *P. pectinatus*, can, I think, have any doubt concerning their distinctness. When those leaves are wanting, as is usually the case when the plant is in fruit, it is often very difficult to distinguish these species.”—C. C. Babington; June, 1853.

Potamogeton prælongus, Wulf.

“On May 30, 1853, I saw this plant in the river called Well Creek, near Nordelph, in the fens of Norfolk. As this is a comparatively new plant, the fact may be worth recording.”—*Id.*

Udora Canadensis.

“Hitherto, Worcestershire and Gloucestershire have been exempt from the inroads of the *Udora*; but it appears that the insidious floater is fast approaching, as I have just received a letter from a botanical friend at Stratford-on-Avon (Mr. W. Cheshire, jun.), with specimens; in which he informs me that the plant has suddenly appeared in the river Avon, at that place. He has perceived and gathered it, this month, both above and below the town, as well as in ditches near the bridge at Stratford, and, from his familiarity with the river, and often boating upon it, is confident it was *not there last year*. Now he finds it in the very bay where the boat is moored, ‘every inch of the water’ about which, he says, was familiar to him. The plants, though numerous, are mostly small, four or five inches in length, and at present barren. He suggests, what I think is very likely, that the winter floods, which were numerous and of long continuance,

floated the Udora down from Rugby, in the vicinity of which it flourished, and have thus established it at Stratford; but the rapidity of its growth in one season seems astonishing. I shall now watch its advent down the Avon into Worcestershire; but hitherto, though I saw a friend from near Eckington yesterday, it has not been reported. The 'soft-flowing Avon' is so still a river, that I fear the Udora will become as great a nuisance there as in Cambridgeshire. My friend says we shall be sure to have it soon, as boats, in passing, break off the brittle stems, thus leaving it to float with the current."—*Edwin Lees; Cedar Terrace, Henwick, Worcester, June 17, 1853.*

Gymnostomum tenue in Yorkshire.

"I take the liberty of sending you a few specimens of *Gymnostomum tenue*, gathered by me, a few days since, from the ruins of the Abbot's House, Fountain's Abbey, Yorkshire. It may perhaps interest some of the readers of the 'Phytologist' to know that this comparatively rare moss grows and fruits abundantly at the above-mentioned place."—*Arthur Hutchinson; Bury, Lancashire, June 15, 1853.*

Claytonia perfoliata.

The President called the attention of the Club to the rapid increase of this North-American plant. The cause of its introduction into this country, he said, did not seem very obvious; but, owing to the abundance of its seeding, the facility with which the seeds germinate, and the adaptability of the plant to our climate, it bid fair to become as thoroughly naturalized as any plant of Transatlantic origin. No one would presume to call in question its exotic origin; but, in after years, it would probably take its station, by the side of *Senecio vulgaris* and *Capsella Bursa-pastoris*, as a common garden weed. This pretty plant was well known to Loudon, who notices its good qualities as a vegetable,—a statement fully confirmed by Mr. Pamplin and others. Mr. Thomas Corder records (*Phytol.* iv. 485) that it grows, in yearly increasing abundance, in the vicinity of Ampthill; and that he cannot learn of its ever having been cultivated in the neighbourhood where it is found; and Mr. Reynolds states that Mr. Corder has sent a supply of specimens, gathered during the present year, for distribution among the members of the Phytological Club. Mr. John Hutchinson has found it this year, growing in great abundance among chickweed, and apparently perfectly established, at Weybridge, in Surrey; and here the plants are of great size and luxuriance. The late Mr. Anderson introduced the *Claytonia* into the Botanic Garden

at Chelsea, where it soon became a most troublesome weed, and remains so at the present day, coming up spontaneously, by thousands, in various parts of the garden. Mr. Anderson gave specimens to the late Mr. Pamplin, of Lavender Hill; and here, again, its usual propensity to increase was strongly developed. During the present summer, it has appeared on and near Clapham Common, and also at Peckham, coming up spontaneously in Mr. Newman's garden. A remarkably good figure, and a good account of the plant, are to be found in Baxter's 'British Flowering Plants,' vol. iv. p. 253. It affords, as pointed out by Mr. Pamplin, admirable examples of two different forms of leaves: *spathulate*, as in the radical leaves; and *perfoliate*, as in the stem-leaves.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, April 14, 1853.—Professor Balfour, President, in the chair.

The following donations were announced to the Society's library and herbarium:—'Report of Select Committee on Morton's Memorial to Congress, anent the Discovery of the Anæsthetic Properties of Sulphuric Ether,' from Dr. W. T. G. Morton; a large parcel of rare Irish plants, for the Society's herbarium, and for distribution, including *Trichomanes radicans*, *Hypericum anglicum*, &c., from Mr. Sibbald; and specimens of *Arundo stricta*, from the shores of Lough Neagh, Antrim, from Mr. C. C. Babington.

Dr. Balfour laid upon the table a Prospectus of Dr. George Johnston's 'Natural History of the Eastern Borders.'

Dr. Balfour mentioned that letters had been received from Mr. J. A. Jeffrey, horticultural collector in Oregon, dated Oregon, January 22, 1853, and Columbia City, February 15, 1853, announcing the despatch of two packages (Nos. 5 and 6) of Coniferæ and other seeds, from the Californian district, &c. Among them are seeds of *Picea nobilis* and *P. grandis*, *Abies Pattoniana*, *Pinus Lambertiana*, *P. monticola*, *P. ponderosa*, *P. macrocarpa*, several unnamed species of *Pinus*, *Cupressus*, and *Juniperus*, besides many other trees, shrubs, and herbaceous plants.

Professor Balfour exhibited the following donations, made to the Museum of Economic Botany at the Royal Botanic Garden since the last meeting of the Society:—From Professor Fleming, New College, Edinburgh: Specimen of a *Lepidodendron*, from Hailes Quarry, near

Edinburgh. From W. L. Lindsay, M.D.: Eighty-two specimens of dyes, manufactured from various lichens.

New Species of Caulerpa.

A paper by R. K. Greville, LL.D., 'On New Species of Caulerpa,' was read.

The author made some introductory remarks on the family of Caulerpeæ, which has been placed near Vaucherieæ; although it has scarcely any affinity with the latter family. Caulerpeæ apparently occupy a place among the Algæ; but their relations do not appear to be determined. The plants grow between high and low water, sending their roots into the sand. They are of a grass-green colour, tough, flat or cylindrical, spreading on the sand by means of surculi, and rooting as they go on, sending down tufts, which resemble in appearance the roots of grasses. The plants have no continuous cavity inside. Their interior is composed of large, anastomosing fibres, with granules and an enormous quantity of starch-grains. Their fructification has been described and figured by Montaigne, in the 'Annales des Sciences Naturelles,' tom. ix. The spores are described as ciliated, like those of Vaucheria. Dr. Greville made remarks on the different species of the genus *Caulerpa*; and he described the following new species:—*Caulerpa asplenioides* (from St. Thomas's, West Indies), *C. laxa*, and *C. fissidentoides* (from Wright's East Indian collection). The paper was illustrated by specimens and drawings.

Myosotis alpestris, Thymus Serpyllum, and T. Chamædrys.

The third part of Mr. C. C. Babington's paper, intituled 'Remarks on British Plants,' was read.

The author first noticed *Myosotis alpestris* of Schmidt, which he now considers to be identical with *M. suaveolens* of Kitabel, and not, as conjectured by him in his 'Manual,' a mere mountain variety of *M. sylvatica*. *M. alpestris* is distinguished from *M. sylvatica* by the attenuated base of the calyx, and the absence of a keel in the fruit. He next alluded to the British species of *Thymus*. There are two British species, he stated, included under the name of *Thymus Serpyllum*; one being the true species; and the other, the *Thymus Chamædrys*. They are distinguished chiefly by their habit, and therefore require to be in a growing state in order to be satisfactorily determined. In *T. Serpyllum*, there is a difference between the flowering shoot and that which is intended to extend the plant. Quite prostrate and rooting shoots are produced each year, which grow from the end of the

shoots of the preceding year, and do not flower; also, there spring from the other axils of these old prostrate parts of the plant, short erect or ascending shoots, which form a linear series, and each of which terminates in a capitate spike, consisting of a very few whorls, and which die back to the base after the seed has fallen. The growing shoot is perennial, but the flowering shoot is annual. In *T. Chamædrys*, there is no such manifest separation between the flowering and growing shoots. The terminal bud often produces the strongest shoot, which itself ends in flowers, differing thus from the terminal shoot of *T. Serpyllum*, which always produces a flowerless shoot. It wants the regularity of *T. Serpyllum*, and presents a dense, irregular, mass of leafy shoots and flowers intermixed. The two species are thus characterized:—

Thymus Serpyllum, L. Stem prostrate, creeping; leaves oblong or lanceolate, narrowed into the flat, fringed stalk; floral leaves similar; flowering shoots ascending; flowers capitate; upper lip of calyx with 3 short, triangular teeth; lower lip of 2 subulate teeth; upper lip of the corolla oblong.

Thymus Chamædrys, L. Stem similar, diffuse, ascending, bi- or quadrifariously hairy; leaves broadly ovate, with a flat, winged stalk; flowers whorled and capitate; upper lip of the calyx with three triangular teeth; lower lip of 2 subulate teeth; upper lip of the corolla semicircular.

Tour in the Hartz Mountains.

The first part of a paper intituled 'Notes of a Tour in the Hartz Mountains,' by W. L. Lindsay, M.D., was read.

The author stated that, with the intention of making a pedestrian tour, for mineralogical and botanical purposes, through the Hartz mountains, he left Holstein (where he had been residing a few weeks, engaged chiefly in botanical and geological excursions) on the 23rd of August, 1850, crossing the Elbe, from Hamburg to Haarbùrg (in the kingdom of Hanover), and proceeding next morning, by rail, to Brunswick and Hartzburg, at the foot of the Brocken. On the evening of the 23rd he made the ascent of the Brocken, the weather being very wet, misty, and cold, and passed the night in the 'Brocken-haus,' a rude hôtel, perched on the summit of the mountain, at an elevation of 3500 feet above the sea. "The districts of Hanover and Brunswick, which are part of the great North-German plain, consist, in great measure, of a series of sand-dunes and sandy heaths, marshes

and peat-bogs, meadows and pastures, here and there interspersed with fertile fields and belts of wood. Their Flora, like their geological structure, greatly resembles that of Holstein; the predominant types of vegetation being marsh, meadow, heath, wood, and sand plants. Among vegetables, cultivated to a considerable extent in the more fertile parts of the country, besides the different cereals, pulse, and potatoes, are tobacco, hops, rape-seed, flax, and chicory. Grain is chiefly raised in the neighbourhood of Brunswick, the most fertile part of the duchy of that name. The whole of Hanover and Brunswick appears to have been long submerged by the German Ocean, judging from their geological structure. Probably no tract of land in Europe, of equal extent, can boast of a less degree of fertility; and we do not speak exaggeratingly when we say that, were it exposed to a very hot and dry tropical climate, instead of a very humid, temperate one, it would more or less resemble in character the great African 'Sahara.' Here, as in Britain, and, indeed, throughout Europe, there is a large amount of *waste* land, *i. e.*, flat land easily susceptible of cultivation, which, instead of being devoted to agriculture and the maintenance of man, is set apart exclusively for the purpose of harbouring and protecting *game*! Were such land placed upon the same footing, with regard to free cultivation, as the prairies of Texas or Australia,—were it leased or sold, at moderate rates, to the peasant farmer or artisan,—we cannot doubt that it would not only soon attain a comparatively high state of cultivation, and consequently increase materially in value, but would supply an honourable and profitable field of labour to thousands of our surplus population, who are at present compelled to emigrate beyond the seas. It must be very poor land indeed which cannot be made, by the ingenuity of man, suitable for the growth of vegetables immediately useful to him or the lower animals. Is it not, therefore, unjust, as well as ungenerous, that the noblest inhabitants of our earth should be set aside for the pleasures or prejudices of the aristocrat! As seen from the plains of Brunswick, the Hartz range does not appear so striking as the Pentlands, seen from Edinburgh. It being a part of the systematic plan of our tour that on this evening we should sleep on the summit of the far-famed Brocken, we resolved on making the ascent, notwithstanding the very unfavourable state of the weather; and accordingly, having selected one of the numerous and importunate fraternity of guides connected with our hotel, we set out on our expedition, about 5 or 6 p.m. After passing a short way up the Radau Valley, we struck off the highway, entering the dark pine-woods which cover the whole of

the base of the Brocken, rendered more dismal on the present occasion by the heavy, wet mist in which they were enshrouded. We now followed a straggling footpath, winding for miles through these pine-woods,—through rugged ravines, and over gigantic boulders, strewn here and there in the wildest confusion: now ascending a new shoulder of the Great or Little Brocken; now descending the slopes of another gorge, or ravine, the dense mist preventing our seeing three feet before us, and effectually soaking our habiliments, and damping our skins, if not our spirits. Still, we pushed on, perseveringly and silently, through wood and brake, over rock and moor, amid the most splendid scenes of desolation (if I may use such an expression), vividly conjuring up before fancy's eye, as we trod this classic ground, the demon scenes of Goethe's 'Faust.' About half-past 7, or 8, p.m., when nearly quite dark, we reached the Brockenhaus, where we were received, in a measure, as 'heroes of a night,' by a parcel of boorish waiters, and a host of yelping curs." The author made a few remarks on the Brocken climate, the circumstances influencing it, and its effects on the vegetation both of the mountains and the plains, noticing in particular the intense cold experienced on the summit, even in mid summer. "It is interesting to find, at an elevation comparatively so insignificant, a miniature glacier, in a deep, shady fissure called the 'Schneeloch,' which lies about 400 feet below the summit, looks to the North-east, and is therefore protected from the direct solar rays, and the warm south winds. The mass of ice or snow itself is some 500 feet long and 16 broad, (according to Brederlow). In its vicinity, we have a miniature representation of all seasons and climates, illustrating what we meet with, on the large scale, when we ascend the Alps, Andes, or Himalayas, from the plains towards the snow-line: on and immediately around the glacier, there is intense cold, with a scanty cryptogamic vegetation; but, gradually, as we recede, we feel the air becoming warmer and more genial, and the vegetation mounting from the lichen and moss, grass and fern, to the *Vaccinium* and heath, evergreen bush and brushwood, blooming flower and ripening fruit." Dr. Landsay made allusion to some of the more important meteorological phenomena observed on the Brocken, and especially to the so-called "spectre," a kind of "Fata Morgana," which is "merely the magnified shadow of an observer, projected upon a perpendicular wall of dense mist opposite him. The circumstances essential to the production of the phenomenon are, that there be in front of an observer a vertical mass of dense mist, rising from a valley, and behind him, and on the same

level, the rays of a rising or setting sun ; the apex of the mountain itself being free from vapour. In such circumstances, an observer sees, on some eminence opposite him, a gigantic shadowy resemblance of himself, waving significantly, if the mass of mist be in motion, surrounded by a beautiful halo, or a magnificent rainbow radiance, or his head alone sending forth the most brilliant stellate rays of golden light, if it be very moist and dense. In winter, it is said that the head of the 'spectre' is often encircled by a most gorgeous starry diadem ; the millions of dancing starlets reflecting a light too dazzling for any mortal long to behold with impunity !” The author noticed shortly the mineralogy and geology of the Brocken and surrounding country, especially with reference to their Flora. The mountain itself consists of a mass of granite, rising through the transition strata (chiefly graywacke and clay-slate), of which the greater part of the Hartz district consists. He then entered at length on the subject of the Brocken Flora, mentioning the points in which it resembled or differed from the Flora of the Scotch Highlands. In particular, he noticed the occurrence of *Dianthus deltoides* and *D. superbus*, *Asplenium germanicum*, *Erysimum odoratum*, &c., about Neustadt ; *Anemone alpina*, *Carex rigida* and *C. vaginata*, *Hieracium alpinum* and *H. Halleri*, *Linnæa borealis*, *Polypodium alpestre*, *Thesium alpinum*, &c., on the summit of the Brocken (Brockenhöhe) ; *Eriophorum alpinum*, &c., on the Brockenfeld ; *Listera cordata*, *Corallorrhiza innata*, *Digitalis purpurea*, *Carex pauciflora*, *Empetrum nigrum*, *Andromeda polifolia*, *Calamagrostis Halleriana*, *Vaccinium uliginosum* and *V. Vitis-Idæa*, *Oxycoccus palustris*, *Scirpus cæspitosus*, *Sonchus alpinus*, *Blechnum boreale*, *Lycopodium Selago*, *L. annotinum*, *L. complanatum*, *L. alpinum*, &c., on the summits of the higher mountains of the Oberharz. He also noticed the occurrence, on the Brocken and neighbouring mountains, of various rare Cryptogams, especially mosses and lichens ; *e. g.*, *Anomodon striatus*, *Grimmia unicolor* and *G. uncinata*, *Gymnomitrium adustum*, *Jungermannia Kunzeana* and *G. Wenzelii*, *Opegrapha petræa*, *Lecidea moro*, *L. glacialis*, *L. atro-rufa*, *L. arctica*, *L. armeniaca*, &c.

The author mentioned incidentally that there is a strong resemblance between the neighbourhood of Hartzburg and Dunkeld, and, in general, that a great similarity exists between much of the Hartz scenery and that of the Scotch Highlands. He gave a description of the “Panorama of the Brocken,” and specified some of the legends and superstitions connected with that mountain.

“The forests are not only an important element of the picturesque,

clothing the greater number of the mountains to their summit; but they may be said to be the very foundation of the prosperity of the poor inhabitants of the Hartz, whose subsistence more or less immediately depends on the mines and smelting-houses, for which this district is so famous. These works are supplied almost exclusively by the neighbouring forests with the wood necessary for building and fuel. Were the supply of wood lessened or cut off, or even rendered more expensive, these establishments would speedily come to an end, and the inhabitants of a densely populated district be inevitably thrown out of employment. Few of the mines are sufficiently remunerative to allow of the consumption, as fuel, of coal, which must be brought from a considerable distance, and at some expense; and, indeed, some of the largest of them are worked solely for the generous purpose of affording employment to a large population entirely dependent on them. Wood is also the chief fuel of the peasantry. In such circumstances, it evidently becomes an important matter to preserve and uprear the old and new forests of such a district; and, I believe, in no part of the world are forests tended with such anxious care, both by Government and private parties, as in the Hartz. From so early a period as the sixteenth century, the forest-regulations (*Förstordnungen*) of the Hartz have been of such acknowledged practical value, that they have, with justice, served as models by which the management of all the forests throughout Germany have subsequently been regulated. Over the administration of forest affairs, there presides a Court of Directors, under whom acts a very extensive and complete staff of officers, from the 'Commissioner of Woods and Forests' down to the humble forester or woodman. The Court of Administration immediately superintends the duties of the forest commissioners (*Ober-förster*). Subject to the latter are the district foresters, or superintendents (*Revier-förster*), who are immediately charged with the protection of the woods, and who are assisted by a numerous staff of forest overseers, huntsmen, wood-watchers, &c. Last, but certainly not least, of all the official staff, are the woodmen, probably about 1500 in number, a very peculiar race in the Hartz, living, to a great degree, quite isolated from the world, shut up in their dense pine-forests, having laws and customs of their own. Once a year the whole staff attends a general meeting of the court, which investigates the industrial results of the whole year, regulates the supply of wood and charcoal for the ensuing year, and examines into all important business matters connected with the forests or their produce. This court acts also in conjunction with the Court of Direction of Mines; there being

evidently between the Directors of Mines and Forests a community of interest. The whole forests of the district were measured and estimated in 1820 ; and this process takes place every thirty years. The superficial extent of the Hartz forests is at present upwards of 451,000 acres ; they were formerly much more extensive, but have been gradually diminished by storms, dry-rot, and, above all, by mismanagement ; an unaccountable lavishness in the supply of wood to the peasantry, and to the mines and forges, having tended to produce a marked disproportion between the production and the demand. In 1524 and 1554, among other privileges and immunities granted to the Hartz and its inhabitants, the mines, and works therewith connected, were allowed (gratuitously !) the wood necessary for building and burning ; and the inhabitants, on payment of a nominal forest-tax, were permitted to cut down according to their wants. The result of such a generous expenditure of timber was, as might have been foreseen, such an amount of its consumption, that it speedily became evident to every one that an opposite line of conduct, or preservative measures, were urgently called for. The iron-forges alone consume (annually !) 12,083,810 cubic feet of coal, and the various mines and smelting-works upwards of 29,500,000 cubic feet of wood.

“ We may shortly notice the circumstances which tend to the destruction of the Hartz forests :—

“ 1. Mismanagement (lavish expenditure of wood, mal-culture, &c.) This cause, which has been a fertile source of mischief in times by-gone, is becoming less and less frequent every day, from the better ideas instilled into the Government, on matters of political and social economy.

“ 2. Storms. The exceedingly violent hurricanes and snow-storms so prevalent in the Hartz, are very hurtful, especially to the pines, which frequently grow in loose, rocky, gravelly, or sandy soils, to which their roots do not adhere very firmly. After every severe storm, we can see thousands of fine, tall pines torn up by the roots, scattered about in wild confusion. We probably do not over state when we say that not less than 25,000 pines are annually destroyed in the Upper Hartz by the wind alone. The great storms of 1800 and 1801 tore up, in the neighbourhood of Elbingerode alone, 315,106 trees ; thus at once destroying the produce of 3000 acres of forest-land. Accumulations of snow and ice, floods and torrents, lightning, &c., also contribute to thin the forests. Avalanches are particularly mischievous on the mountains, and in the mountain-valleys, often clearing

away whole pieces of a forest, or thinning patches in the thickest parts of it.

"3. Wild animals also destroy large numbers of trees, by biting off the bark or young twigs; peeling away the juicy bark, by blows with their horns; or tearing up the young plants. The wild doves and finches in particular commit great depredations; countless numbers of them attacking the pine-seed, or chopping up the germinating plants: so that plantations of pines in the young state must be watched, night and day, against these feathered robbers. The most deadly foes of the forests, however, are, unquestionably, various species of beetle, especially those of *Bostrichus* (e. g., *B. octodentatus*, *B. Laricis*, *B. calcographus*, *B. villosus*, *B. Hylesinus*, *B. Fraxini*), which burrow under the bark of the older trees, and there deposit their eggs. Great care is taken by the woodmen to kill these animals before they lay their eggs; but, notwithstanding all their efforts, many thousand trees annually fall victims to this scourge.

"4. Dry-rot, which at one period during the last century caused the destruction of 15,196 acres of forest in the Kingdom of Hanover alone."

The author then spoke of the constituents, or elements, of the Hartz forests, which are divided into "Hochwald," "Mittelwald," and "Niederwald," according to their position on the mountain-slopes. "The forest is most extensive and luxuriant on the southern and eastern mountain-slopes and valleys, and becomes more scanty the more we approach the north and west, and the higher we ascend. While on the gentle slopes of the east and south borders of the range, the forest (consisting chiefly of oak, birch, beech, and fir) grows luxuriantly at an elevation of 1600 feet, on the north and west these trees are displaced, at 1300 feet, by the dismal pine. The red beech (*Fagus sylvatica*) is, especially in the Unterrharz, a magnificent, tall tree, probably next, in point of importance, to the pine, constituting about one-third of the forests of the lower Hartz. The hornbeam (*Carpinus Betulus*), besides being common in the woods, is greatly cultivated, and thrives exceedingly well. The different species of *Quercus* are common in all the lower forests. The maple (*Acer pseudo-Platanus*) and ash (species of *Fraxinus*) spring up abundantly in the beech-woods, and are also planted, to a considerable extent, on low, bare knolls. The elm (*Ulmus campestris*) occurs, comparatively sparingly, in the lower forests. The birch (*Betula alba*) is common in the 'Mittelwald,' as underwood, ascending the hills to an elevation of 2680 feet. On sheltered and sunny banks about the base

of the hills, we find here and there the linden (*Tilia Europæa*), wild chestnut (*Æsculus Hippocastanum*), aspen (*Populus tremula*), and black poplar (*P. nigra*). On flat river-banks and marshy plains, and also occurring in alpine regions, at a height of 2650 feet, the alder (*Betula Alnus*) and the knotty willow (*Salix capræa*) flourish, as underwood. A number of experiments, conducted in the neighbourhood of Blankenburg, during the years 1730-50, show that the Hartz is well suited for the growth of a number of foreign trees (e. g., American oak, cherry, tame chestnut, white fir, northern alder, &c.) On the hill-slopes, here and there, may be noticed a few groups of the larch (*Pinus Larix*), which was first introduced into the Hartz in 1731. The Scotch fir (*Pinus sylvestris*) is sparingly interspersed among the *Pinus Abies* and *P. Larix*. The yew (*Taxus baccata*) grows, as a hermit, on a few barren, rugged rocks, and the juniper (*Juniperus communis*) on dry and exposed sandy hillocks. The hazel (*Corylus Avellana*) formerly thrived luxuriantly, but has lately disappeared from the forests, on account of mismanagement. In the woods, *Berberis vulgaris*, *Rosa canina* and *R. villosa*, *Prunus spinosa*, and a number of our ordinary herbaceous plants grow plentifully. *Rubus Idæus* and *R. fruticosus* occur, more sparingly, on old walls and rocks.* In the forests of the lower Hartz, the gloomy pine (*Pinus Abies*) is common; but it reigns exclusively, attaining a great height, in those of the upper Hartz; and the value of its timber in this district is such, that in many places it would be difficult to say whether the pine-woods on the surface, or the rich ores in the bowels of a mountain, were the most valuable. The pine did not formerly cover such an extent of the Hartz mountains as it now does, but has gradually replaced and displaced the oak, beech, birch, &c., which have been destroyed by accident or mismanagement, and which ascended to a much greater height on the hills than at present. The Hartz pines are exceedingly handsome trees, rising to a great height (sometimes 120 feet), and thus making beautiful masts. The handsomest pines I ever saw were in the valley of the Oker, near Goslar. This tree is daily extending itself in the Hartz, flourishing easily where no other forest tree could attempt to grow. It ascends the mountains to the height of 2800 feet, runs down into the lowland val-

* * *Sorbus Aucuparia* is much planted as a border to highways, and as an ornamental hedge or garden plant. The other trees, shrubs, and flowers met with in and about the pine-woods are few and insignificant; the brown soil being carpeted by the *Digitalis purpurea*, *Epilobium angustifolium*, *Pyrola uniflora*, *Melampyrum sylvaticum*, *Oxalis Acetosella*, and similar sylvan species."

leys, springs up on the thinnest strata of sandy soil, and even clings firmly to the clefts and fissures of bare rocks. Unfortunately, its development comparatively seldom attains a high degree of perfection; the loose hold taken by its slender roots of the porous soils or rocks, rendering it extremely liable to suffer from the winds, here so prevalent.

"Many of the Hartz inhabitants, and especially the juvenile portion of them, obtain a livelihood by collecting wild forest fruits (*e. g.*, the bilberry, strawberry, raspberry, edible Fungi, &c.), seeds of forest trees (particularly the birch, beech, oak, and fir), German tinder ('Feuerschwann,' *i. e.*, *Boletus ignarius*), and various officinal herbs (which are in great repute in domestic medical practice in Germany), and by preparing 'Birkenwasser,' and other cooling liqueurs, from the sap of the forest trees."

Characters of the Natural Order Solanaceæ.

A paper by Thomas Anderson, Esq., 'On the Characters of the Natural Order Solanaceæ,' was read.

The author stated that his object was to bring before the Society the subject of a new arrangement of the Solanaceæ, by which Mr. Miers proposes to divide that order; and, after giving the characters of his two divisions, to endeavour to adduce a few reasons, drawn from a consideration of the chemical constitution and physiological actions of the plants, for adopting this new classification of the family.

Dr. Robert Brown, forty-four years ago, in his 'Prodromus Floræ Novæ Hollandiæ,' hinted that certain genera of the Solanaceæ should either be excluded, or be placed in a separate section, the nucleus of a new order. His remarks, however, were confined to the tribe Verbasceæ only, now placed, by some botanists, among the Scrophularineæ. Again, Mr. Bentham, author of the monograph on the Scrophularineæ, in the tenth volume of De Candolle's 'Prodromus,' placed as a tribe of that order the Salpiglossideæ, till then coupled with the Solanaceæ. Notwithstanding these and other attempts to arrange properly these orders, the confusion still existed; and it has been left to Mr. J. Miers to propose what seems to me to be a very rational and proper way of surmounting the difficulty, namely, by establishing a new natural order, intermediate with the Solanaceæ and Scrophularineæ, and intended to include the anomalies of both. The following is the substance of the characters of these two orders, and the interposed one, as Mr. Miers has given them:—First, the true Solanaceæ, with a gamosepalous calyx, 5- (rarely 4-) partite border, the lobes of

which are nearly regular and equal, and the margins always valvate or induplicato-valvate in æstivation; stamens epipetalous, alternate with and equal to the number of lobes, sometimes unequal in size and length, fifth rarely sterile; anthers introrse, bursting by longitudinal slits; ovary generally 2-celled, rarely 3- to 5-locular; style simple; stigma 2-lobed; fruit a capsule or berry, 2-locular; seeds albuminous, numerous; embryo in one suborder slender, terete, curved spirally or in an annular form, in another short and straight; radicle always pointing to the basal angle of the seed, and turned away a short distance from the lateral and somewhat marginal (never basal) hilum. The order is composed of plants with dentate (rarely pinnatifid), exstipulate leaves; inflorescence axillary, more generally extra-axillary or lateral, and in development centrifugal, single, terminal, cymose, paniced, racemose or corymbose.

The plants of this order occur in greatest abundance in the tropics, especially in South America; but some of them are found in all the warmer regions of the earth. In Europe, they are met with principally in those countries bordering on the Mediterranean. In Britain, we have only two indigenous species, *Solanum nigrum* and *S. Dulcamara*. This order does not possess any distinctly narcotic plant, nor any species known to dilate the pupil, either when administered internally, or when applied to the eye: even in large doses, they do not seem to exert any influence on the system, beyond a diuretic and diaphoretic action.

The tubers of some of the species, such as the potato, contain a large quantity of starch, and other nutritive principles; and therefore, over a large extent of the globe, they form most important articles of food.

The new order, the *Atropaceæ*, as has been already stated, is intermediate with the *Solanaceæ* and *Scrophularineæ*, and embraces the anomalies of both, most numerous in the first. Its characters, according to Mr. Miers, are:—Calyx tubular, persistent, more or less divided; border of corolla 5-lobed, seldom bilabiate, slightly unequal, lobes always imbricate in æstivation, never valvate, the margins of one lobe being free from those of the others, in bud often plicated longitudinally; stamens 5, epipetalous, alternate with the lobes of the corolla, usually all fertile, rarely one or three sterile; filaments filiform, one of them sometimes shorter than the others; anthers introrse, sometimes extrorse, bilobed, lobe-cells parallel, usually opening longitudinally, one lobe sometimes sterile; ovary rarely more than bilocular; ovules generally ascending, attached to the fleshy

dissepiment; style simple, stigma bilobed, often peculiarly shaped; fruit a berry, or else a capsule; seed albuminous, generally uniform or compressed; embryo straight, or more or less curved, sometimes spirally; radicle turned from the hilum, which is more lateral than in the true Solanaceæ.

They are herbaceous plants, or shrubs, with alternate or fasciculate leaves; inflorescence somewhat extra-axillary and lateral, in regard to the insertion of the petiole. The order is very poisonous, including such plants as *Datura Stramonium*, *D. ferox*, and *D. Metel*, *Hyoscyamus niger* and *H. albus*, *Atropa Belladonna*, *Nicotiana*, &c. Like the preceding order, the members of this are natives of the warmer parts of the earth, such as the East Indies, China, north coast of Africa, the Levant, and especially of South America. The order seems, however, to extend further north than the former, as, in Siberia, there is a species of *Hyoscyamus*, in lat. 65° or 66° N., and, in Norway, so far north as 64°. In the warmer valleys, Mr. Anderson observed the *Hyoscyamus niger*, growing luxuriantly, where *Solanum tuberosum*, the only representative there of Mr. Miers's Solanaceæ, is stunted, both in the size of the plant and of the tubers, and seldom or never flowers.

Of the Scrophularineæ, the leading characters are:—The tubular corolla more or less curved and irregular, with 4- or 5-partite border, lobes unequal, bilabiate, imbricate, never valvate in æstivation; anthers always introrse; fruit almost always capsular, in a few cases a berry; embryo straight, or slightly curved, with the radicle pointing towards the basal hilum; cauline leaves generally opposite; floral leaves often alternate; inflorescence always axillary.*

This division of the Solanaceæ, notwithstanding the very just objection of most botanists to the multiplication of natural orders, could, he thought, be properly defended, both from the structural characters pointed out by Mr. Miers, and those which Mr. Anderson had been led to draw, from an investigation of the chemistry and physiological actions of the plants.

At least, so far as our knowledge goes of the chemical history, and action on the animal economy, of the *Atropaceæ* and *Solanaceæ*, a notable correspondence between botanical characters and physiological properties may be observed; or, in other words, by this new arrangement plants of analogous actions are more closely united,—

* Mr. Miers's observations will be found at length in the 'Annals of Natural History,' second series, Vol. iii. No. 15, and Vol. xi. No. 61.

a result of no mean importance. As a proof of this statement, the *Atropaceæ*, from its botanical characters, comprehends the genera *Atropa*, *Mandragora*, *Datura*, containing almost twenty poisonous species, *Hyoscyamus*, and *Nicotiana*, all of which are eminently poisonous, and, with the exception of the last genus, and this rather doubtful, possessed of the power of dilating the pupil, and rendering the iris insensible to the stimulus of light. Since the first introduction of the natural systems, this action on the pupil has been considered as a most characteristic mark of the *Solanaceæ*, along with well-defined narcotic properties; but the order was known to contain, besides some plants of very feeble narcotic properties, many others entirely destitute of any such action. Among these may be mentioned the *Solanum nigrum*, *S. Dulcamara*, *S. tuberosum*, *S. oleraceum*, *S. auriculatum*, *S. æthiopicum*, and *S. esculentum*, used as food; *S. crispum*, considered a tonic by the natives of *S. America*, and, in truth, the vast genus *Solanum*, composing nearly one-sixth of the order, is not to be designated a poisonous genus. To mention another anomaly in the old order: the various species of *Capsicum* are stimulant, and in considerable doses have caused death, from inflammation of the alimentary canal; but they never produce the slightest approach to narcotism.

When Mr. Miers's characters are applied to the old order, all its known narcotic plants are allotted to the *Atropaceæ*; and the author thought he might safely say that, in the *Solanaceæ*, there is not one plant deserving the appellation of a narcotic. The only statement he found about any plants of Miers's *Solanaceæ* producing dilatation of the pupil, is by M. Dunal, in an essay published many years ago, in which he said he thought he had seen *Solanum nigrum*, *S. villosum*, *S. nodiflorum*, and *S. miniatum*, on their expressed juice being applied to the eye, produce a very slight dilatation, and insensibility of the organ to a bright light; and this condition, he further remarks, continues only from four to five hours; but up to this time Mr. Anderson had found no authentication of these remarks.

When we examine the alkaloids of the two families, we find the same difference in their action. Solanine, derived from many sources, although poisonous, does not, on the authority of Soubeirn, dilate the pupil; whereas all the alkaloids of the *Atropaceæ*, such as atropine, hyoscyamine, and daturine, and perhaps nicotine, exert a wonderful power on the iris, even in very minute quantity.

Mr. Anderson concluded his remarks with the wish that Mr. Miers's modifications may be generally adopted, as keeping pace with our

increased knowledge of the chemical constitution and physiological properties of De Candolle's *Solanaceæ*.

A paper by Mr. M^cNab, intituled 'Register of the Flowering of certain Hardy Plants in the Royal Botanic Garden, Edinburgh, compared with the flowering of the same species, and in most cases the identical plants, reported on during the three previous years,' was read.

A paper by Mr. P. S. Robertson, 'On the Effects of the past Winter on the *Coniferæ* and other Plants, in the open ground, in Golden Acres Nursery,' was read.

Mr. P. S. Robertson, of Golden Acres, was elected an Associate.

Thursday, May 12, 1853.—Professor Balfour, President, in the chair.

Donations of British plants for the Society's herbarium were announced from Mr. More, of Trinity College, Cambridge, and Mr. Tate, of Edinburgh.

Professor Balfour exhibited the following donations to the Museum of Economic Botany at the Garden:—From Messrs. P. Lawson & Son, nurserymen: Six cones, from Mexico, supposed to be *Pinus filifolia*. From Miss Gibson-Craig, Riccarton: Specimen of the bulb of a wild hyacinth, which had been perforated while growing by the creeping stem of *Triticum repens*. From Mr. William Gorrie, Preston: Sections of the stems of *Prunus Padus* and *Quercus sessiliflora*.

The President noticed, that a letter had been received from Mr. John Jeffray, the botanical collector in Oregon, dated March 14, 1853, in which he announced the despatch of various boxes, up to No. 9, by different routes. He was on his way to the Rocky Mountains.

Miss Gibson-Craig exhibited remarkable specimens of *Lastrea Filix-mas* and *Athyrium Filix-fœmina*, in which the lateral and terminal pinnae were divided at their extremities into numerous, small, pinna-tid frondlets, giving a peculiarly tufted and crisped appearance to the margin of the fronds, which were of the ordinary size.

Dr. Mackay exhibited a specimen of *Ceanothus rigidus*, in flower, from the open wall of Trinity-College Garden, Dublin, where it was blooming freely on the 3rd of May.

The Rev. G. E. Smith exhibited specimens of *Centaurea Jacea*, from near Killin.

Dr. Balfour exhibited specimens of several species of sea-weeds from Dr. Curdie.

A paper by Dr. Macgowan, of Ningpo, 'On the Soap Beans of China,' was read.

In this paper, the author gave a popular description, chiefly from Chinese authorities, of two species of *Cæsalpinia*, which furnish the soap-bean (*tsaukih*) and the plump soap-bean (*fitsaukih*) of the Chinese. The beans have marked saponaceous qualities, and are used as detergents, for cleaning silver vessels, &c.

Flora of Arran.

A paper by Dr. Balfour, 'On the Flora of the Island of Arran,' was read.

Dr. Balfour gave an account of the Geology of the Island, and noticed the plants which occur in different districts, in connexion with the rocks. He mentioned that he had observed between 500 and 600 Phanerogamous plants, and 27 ferns and *Equiseta*. He made some remarks on the rarer and more interesting species, especially *Triticum laxum*, *Rosa involuta*, various forms of *Rubi*, *Pyrus fennica*, *Hypericum dubium*, *Mentha sylvestris*, var. *velutina*, *Ula montana*, *Petalonema alatum*, *Ginnania furcellata*, *Fucus vesiculosus*, *evesiculosus*, &c.; also *Lastrea Fœnisecii* and *L. dilatata*, the rhizomes of which ferns appear to differ in the number and arrangement of the vascular bundles. The section of *L. dilatata* is generally pale, and has comparatively few dark bundles; while that of *L. Fœnisecii* is dotted with black specks.

Dyeing Properties of Lichens.

The third part of Mr. Lindsay's paper 'On the Dyeing Properties of the Lichens' was read.

The author detailed the various processes of manufacture, as carried on in different countries, on the large scale (by the manufacturer), and small scale (by the peasant), with the principles on which these are severally founded. The following is the rationale of the usual process; the mode of treatment, in the case of different lichens, being the same in principle, though differing slightly in detail:—

1. The plant is carefully cleaned, dried, and comminuted, or reduced to powder.
2. This powder is ground, or made into a pulp with water.
3. The ammoniacal liquor, of whatever kind, is added, in smaller or greater quantity, from time to time.
4. The whole mass is constantly stirred, so as to expose it, as freely as possible, to the action of the air.

5. In the majority of cases, some thickening agent is subsequently added, to impart consistence.

And, during the whole process, a temperature of about 60° is kept up.

“To analyse these various steps of the process: the preparatory cleaning is rendered necessary, by the intimate connexion which subsists between lichens and their bases of support, many species corroding and disintegrating even the hardest quartz; hence, many (especially pulverulent and crustaceous species) require a lengthy steeping and washing in water, to free them from adherent earthy impurities. The drying is merely to facilitate the next step, or pulverization, the object of which is to expose, to mechanical and chemical agents, during maceration, the greatest possible extent of surface. The steeping of the powdered plant in water, or its formation therewith into a pulp, assists the subsequent action of the ammoniacal macerant on its particles. Ammonia is the alkali generally employed, in some shape, for causing the development of colour, because experimentally found most uniformly suitable therefor. It is added in small quantity, and from time to time, to supply the loss constantly occurring, from its great tendency to volatilize, especially in the state of free exposure to the air, in which the pulpy mass is kept. The mixture is constantly stirred, for the purpose of more fully exposing every part of it to the action of atmospheric oxygen. The thickening agents sometimes added, towards the end or after the termination of the process of manufacture, are usually genuine adulterations; but they are, also, sometimes added merely to impart consistence, thereby facilitating the making up of the mass into balls, cakes, or lumps, for more easy and convenient preservation. The continued application, during the whole process, of a moderate amount of heat, is a point of great importance. Westring found, as the result of a long series of experiments with a view to determine the effect of heat in the elimination of these colours, that he could, at pleasure, increase or diminish their brilliancy, or vary their tint, according as he macerated in hot or cold liquids. Though I have not been able to verify all Westring's special results, still I quite agree with him in the general ones. I have repeatedly had occasion to observe, however, that, while a continued *moderate* degree of heat was highly conducive to the colour-development, a very slight elevation of temperature caused immediate deterioration; and, in such cases, cold maceration of the same lichen was invariably more successful in its results. My own experiments show that, up to a certain point,

and *cæteris paribus*, the rapidity of elimination, and the richness of colour ultimately produced, stand in a direct ratio to the degree of temperature, but that, above this point, the same ratio immediately declines. The most rapid evolution, however, appears to be inconsistent with the production of the richest and most permanent tints ; for I generally found that the colours most speedily produced by a pretty high temperature, and excess of alkalis, faded most rapidly. I have therefore been more successful in obtaining fine colours by macerating in closed vials, in cool places, with common spring water, and a moderate quantity of alkali, than when I endeavoured (prematurely, as it were) to force on development by an opposite combination of circumstances. In former days, the ammonia was wholly supplied in the form of stale, or putrid, urine, which was gradually added to the powdered lichen ; the mixture frequently stirred, fully exposed to the air, and set aside, to ferment, in a moderately warm locality ; when a sufficient depth of colour and a proper consistence were attained, the mass was dried, after having been made up in the form of balls, cakes, or lumps ; or it was preserved for use in the state of powder. Urine, as a decomposing agent, gradually gave place to different kinds of ammoniacal liquids, obtained by the distillation of decaying animal matters ; and, at the present day, the manufacturers of orchil, cudbear, and litmus, generally use either tolerably pure dilute liquor ammoniæ, or the ammonial liquor of gas-works. Maceration in stale urine, however, is not only still had recourse to in many remote parts of our highlands and islands, by the old women, for preparing dye-stuffs from various kinds of ‘corkir,’* but is largely employed in the manufactories of some of the most extensive orchil and cudbear-makers in England. Manufacturers find, what we should *à priori* expect, that its value as a metamorphosing agent is directly in proportion to the amount of urea it contains. When, therefore, it is very deficient in this substance, it is comparatively useless, and is consequently rejected. This is evidently due to the small amount of carbonate of ammonia generated by the decomposition of the diminished portion of the urea. Mr. Reynolds, of London, informs me that a large orchil and cudbear-manufactory in Leeds, which is in the constant habit of using large quantities of stale urine, collecting it from the neighbourhood, ‘find that, when collected from beer-shops, it is utterly worthless, and they refuse it accordingly.’ As thus employed, urine has generally been looked upon merely as a cheap and easily

* * The vernacular generic term for lichens capable of yielding colouring matters.”

procurable ammoniacal solution; but that it is something more is rendered extremely probable, by the fact that large English firms, which, besides preparing orchil and cudbear, also manufacture liquid ammonia, of every degree of strength and purity, still find it advantageous to employ urine, instead of pure dilute ammoniacal liquors, in the production of these pigments. Perhaps its true value may depend on its putrefactive state; the chemical changes in the nitrogenous or other constituents of the decomposing liquid being communicated catalytically to the colorific (but colourless) principles of the lichen, thereby inducing an alteration in their physical characters, as well as in their chemical composition. This hypothesis would (at first sight) apparently explain a series of phenomena, of the true nature of which we at present know very little; and it appears to be supported by the fact, that on the Continent (and particularly in Holland and France), stagnant and putrid waters, which contain a large amount of decaying animal and vegetable matters (*e. g.*, the filthy stream of the Bièvre, at Paris), are largely used in the manufacture of orchil and litmus, as macerating agents, because experimentally found most efficient in causing the elimination of these colouring matters. But I cannot yet reconcile this hypothesis, nor the supposition that the changes concerned in the production of these pigments depend essentially on some action of ammonia, or its elements, on the colorific principles of the plant, with the fact that the same colours are capable of being evolved, though in a minor degree, by other alkalies than ammonia, and by liquids certainly not in any state of decomposition (*e. g.*, distilled, or pure spring water). To the putrid urine, lime is sometimes added, materially assisting the colour-metamorphosis, by uniting with, and thereby removing, the carbonic acid of the carbonate of ammonia, generated in the liquid; thus separating the ammonia, which then acts as a free agent. The necessity for free exposure to atmospheric air, is well illustrated by the simple fact that many of the lichen-colours, which are at first dull in tint, are increased in intensity and brightness by free exposure and prolonged maceration. Some time ago, I had occasion to open a small bottle of 'red orchil,' prepared in Glasgow, which had lain for some time on the shelves of a museum. Instead of possessing an intense purple-red colour, and a fine ammoniacal aroma, it was of a very dirty, nondescript, brownish red, had a pulsataceous or semifluid clotty consistence, and a musty, urinous, disagreeable smell. But, immediately on spreading it, in thin layers, on paper, thereby exposing a large surface to the action of the air, it acquired its characteristic colour. The following are the chief thick-

ening agents (in most cases added as adulterations :—Gypsum, chalk, flour, kelp, lime, and some siliceous and argillaceous matters ; and, in some kinds of litmus, according to Pereira, indigo is frequently added, to heighten the colour.”

The author entered somewhat minutely into the details of the modifications of the typical process of manufacture (as above mentioned), according to the country where such manufacture is carried on, the species from which the colour is to be extracted, and according as the dye is prepared on the large or small scale, &c. ; and as instances of these local and other modifications, he referred to the mode of preparing “scrottyie” and “korkalett” by the Shetland peasantry ; of various kinds of “corkir,” by the Scotch, Irish, and Welsh ; and various kinds of orchil and litmus, on the Continent, as detailed by Berthollet, Hellot, Micheli, Neumann, Willemet, and others.

Mordants are necessary for the fixation of the colour of most, if not all, of the lichen-dyes, which are characteristically very fugitive ; these accessories, however, seldom acting as mere media of connexion between the fabric and dye, but usually also brightening, or otherwise modifying, the natural colour of the latter. Westring deprecated mordants, under the impression that they would destroy the gummy constituents of the lichens, which he supposed to be the source of the fixation of the colouring matters. That mordants are not essential adjuncts to the process of dyeing, is rendered probable by the statements of Westring and others, as to their having obtained, without such aid, colours, if not absolutely permanent, still sufficiently so to resist the action both of acids and alkalies, and long exposure to the solar rays. From the transient character of the colours yielded by the lichen family, it happens that the part they play in the art of dyeing is but secondary, being used chiefly to contribute a peculiar bloom and richness to other dyes. But this may perhaps be due, in great measure, to the little we at present know of the chemistry of these colouring matters ; and we may yet discover means of rendering them equal to our cochineals, logwoods, and indigoes ; while they are (or might, at least, be) far superior in point of cheapness. And we have yet to acquire a very great amount of information as to the colour-yielding powers of the lichens (apart altogether from the question of fixity, or permanence, of tint), which we never shall obtain till this family has been extensively examined, with this special object in view, both at home and abroad. Hoffmann mentions that the nature of the water used in making the various baths, through which the fabric is passed in the process of dyeing, is important. In France

and Holland it has been found, what we should scarcely *à priori* expect, that muddy, dirty, or stagnant water was most suitable; and this circumstance is abundantly taken advantage of in Haarlem, Paris, and Lyons. To this circumstance, he thinks, is partially due the celebrity of the dirty stream of the Bièvre, or Gobelins, in Paris. Some think that the peculiar action of such water, as a macerant or bath, depends on its saline and other ingredients. Westring and others attribute it to the oxygen which it holds in solution; this element apparently being essential to the development of these colouring matters. In proof of the latter view, Westring mentions having noticed that water which had stood a few days in a heated room was no longer suitable for the process of dyeing; and he throws out a hint that, in the case, at least, of lichens whose colouring matters can be eliminated by cold maceration alone, much brighter and richer tints might be obtained by charging the water with excess of oxygen. The same author also asserts, what we should, at first sight, be less inclined to admit, that the very nature of the atmosphere under which the process is carried on, exercises a most important result on its effects. Whether this depends on the relative amount of oxygen, ammonia, &c., existing in it, or what is the rationale of the phenomenon (assuming it meanwhile to be true), Dr. Lindsay could not at present pretend to say.

The author concluded his paper by details of a few of his own experiments on the development of lichen colouring-matters, showing how, and to what extent, experiments on the small scale differ from operations on the large scale. His observations were illustrated by a very complete series of lichen-dyes, which he had recently presented to the Museum of Economic Botany at the Royal Botanic Garden. He promised to lay before the Society, at a future meeting, the further results of his researches on this important subject.

A number of interesting plants, from the Botanic Garden, were placed on the table; amongst others, a collection of rare Scotch and foreign alpine plants; flowering plants of *Siphocampylos amœnus*, *Brachysema acuminata*, *Schottia lævis*, *Chorizema superba*, and *Gloxinia Victoria Reginae*, recently presented to the Garden by Messrs. Low & Son, of the Clapton Nursery; *Tagelia bituminosa* and *Balsamina latifolia-alba*, presented by Messrs. Henderson & Son, of the Wellington Nursery; *Vriesia speciosa*, presented by Messrs. Jackson, of the Kingston Nurseries; and *Cheiranthra linearis*, a New-Holland plant, with blue flowers, and declinate palmate anthers, presented

by Messrs. S. & G. Rinz, of the Frankfurt Nursery. There were also exhibited a fruited specimen of *Podocarpus Mackoyi* (not known to have previously produced fruit in this neighbourhood); *Passiflora lunata*, which had grown in a Wardian case, recently sent home, and transmitted to the Garden, by Mr. Thomson, of Banchory (the leaves exhibited on the under surface a beautiful series of transparent glands, containing a clear, viscid matter); also a germinating seed of *Zamia* sp., presented to the Garden by Sir William Gibson-Craig, Bart.

Mr. Balfour called attention to a curious monstrosity in a plant of *Gloxinia Victoria Reginæ*, showing chorization, or splitting, of the corolla, on the upper side. The dilaminated portions were of a dark blue colour, while the rest of the flower was pale.

George Ralph Tate, Esq., of 16, Cumberland Street, was elected an Ordinary Fellow.

Thursday, June 9, 1853.—Professor Balfour, President, in the chair.

The following donations to the Society's library were announced :—‘Memoirs’ and other publications of the Cherbourg Society for Natural Science, from the Society; ‘Bonplandia’ for June, from the Editors.

Dr. Balfour announced a donation of plants to the University Herbarium, from Mr. Keddie, consisting of specimens collected on Lebanon, by Mr. Sommerville; and exhibited, from Lady and Miss Harvey, living specimens of *Ophrys fucifera*, var. *aranifera*; also sections of woods, including one of the stem of *Cordia Sebestana*, from Dr. Gilbert M’Nab, Jamaica.

Dr. Balfour exhibited several recent donations to the Museum of Economic Botany at the Garden.

Dr. Balfour made remarks on the palms in the Botanic Garden, and stated that some of them had sent their fronds through the roof of the palm-house, and that unless measures were taken immediately for making an addition to the house, he would be under the necessity of destroying some of the finest palms in Britain,—a calamity which he hoped would be averted, by the timely interference of the Commissioners for Public Buildings, to whom he had made a strong representation on the subject. He showed that the public of Edinburgh were deeply interested in the matter; and he had no doubt that he would be aided by them in his efforts to secure for the metropolis of

Scotland, and for the botanical school of Edinburgh, a suitable palm-house, as well as a Victoria-house.

The following are the measurements made, by Mr. M'Nab, of some of the palms in the Edinburgh Botanic Garden. In giving the height, the leafy part at the top of the caudex is included, along with the tub in which the plant is growing:—*Acrocomia aculeata*, 38 feet; *Areca triandra*, 19; *Caryota urens*, 43, (frond 4 feet 9 inches beyond the roof); *Chamærops humilis*, var. *elata*, 20 feet; *Cocos nucifera*, 18; *Enterpe montana*, 38, (frond about 2 feet beyond the roof); *Livistonia chinensis*, 40 feet, (fronds bent down by the roof of the house); *Sagus Rumphii*, 43 feet, (fronds about 10 inches beyond the roof); *Seaforthia elegans*, 22 feet. Some of these palms, he stated, were between fifty and sixty years old.

Dr. Greville trusted that Dr. Balfour's efforts would be successful in getting such an enlargement of the palm-house as would enable him to preserve the noble specimens now in the garden.

Dr. Balfour stated that two boxes had been received from Mr. Jeffray, the botanical collector in Oregon, containing numerous seeds; among the rest, seeds and cones of *Pinus flexilis* and *P. lasiocarpa*, *Picea nobilis*, *Abies Pattoni*, *Pinus monticola* and *P. ponderosa*, some of the kinds being in considerable quantity.

Botanical Trip to Ireland.

Dr. Balfour gave an account of a botanical trip to Ireland, in August, 1852, with some of his pupils. The party consisted of Messrs. Balfour, Sutherland, Fraser, Cowan, Menzies, Sibbald, M'Allum, and Cockell. Dr. B. gave an account of the three Floras of Ireland, as distinguished by Professor Forbes, viz., the Germanic, or Central European, Flora, in the north and east; the Devonian, or Armorican, Flora, in the south; and the Asturian Flora in the west. The districts of all these Floras were visited by the party. Dr. B. also gave a general sketch of the Geology of the districts, consisting of rocks belonging to the upper Silurian and the carboniferous series. In the vicinity of Dublin, the party were aided by Dr. Mackay, Professor Allman, and Dr. Robert Ball, to all of whom they were deeply indebted. They visited Howth, Portmarnock, Malahide, the Dargle, and Powerscourt; and collected, among others, the following species:—*Crithmum maritimum*, *Inula crithmoides* and *I. dysenterica*, *Obione portulacoides*, *Erodium maritimum* and *E. moschatum*, *Beta maritima*, *Carlina vulgaris*, *Ulex nanus*, *Statice occidentalis* and *S. bahusiensis*, *Apium graveolens*, *Euphorbia Paralias*, *Orchis pyramidalis*, *Hymeno-*

phyllum *Wilsoni*, and *Lastrea Fœniseeii*. The Flora much resembled that of the Galloway coast. In the neighbourhood of Cork and Queenstown, the party collected *Ceterach officinarum*, *Cœnanthe fistulosa*, *Senebiera didyma*, *Senecio squalidus*, *Fœniculum vulgare*, *Euphorbia portlandica*, *Sinapis nigra*, *Antirrhinum Orontium*, *Petasites fragrans* (near Monkstown), and *Hypericum anglicum* (near Glanmire). In the vicinity of Bandon, under the guidance of Mr. Allman, there were gathered *Wahlenbergia hederacea*, *Hypericum elodes*, *Scutellaria minor*, *Pinguicula lusitanica*, and *Linaria repens*. Near Bantry and Glengarriff, *Eufragia viscosa*, *Calamintha officinalis*, *Hymenophyllum Tunbridgense*, and *Euphorbia hiberna* were seen. On the hilly road to Kenmare, there was abundance of *Saxifraga umbrosa*, and, near Killarney, fine specimens of *Osmunda regalis* and of *Pteris aquilina*; the latter being in some instances nearly twelve feet long. The abundance of the Robertsonian Saxifrages, and of ferns, characterize the mild and moist climate of Killarney.

The Silurian mountains of Killarney, such as M'Gillicuddy's Reeks (Cairn Tuhol) and Mangerton, did not display an alpine vegetation. *Saxifraga umbrosa*, in all its forms, *serratifolia*, *elegans*, &c., covered the hills to their summit. The other plants found on the mountains were *Saxifraga hirta*, *Aira cæspitosa-vivipara*, *Asplenium viride*, *Sedum Rhodiola*, *Cystopteris fragilis*, *Pinguicula grandiflora*, and *Drosera longifolia*. On the islands of the lakes, *Arbutus Unedo*, and, in various parts of the lakes, *Nymphæa alba*, *Nuphar lutea*, and *Lobelia Dortmanna*; at Ross Castle, *Lastrea Thelypteris*; and near Turk Waterfall, *Trichomanes radicans*. The Robertsonian Saxifrages, and the rare ferns noticed, with *Pinguicula grandiflora*, may be said to characterize the Flora of Killarney. After leaving Killarney, the party visited Dingle, and ascended Brandon mountain, on which they found *Ranunculus acris*, var. *Friesii*, *Polystichum Lonchitis*, *Poa Balfourii*? *Saxifraga hirta* and *S. affinis*? *Cystopteris fragilis*, and *Festuca vivipara*; near the shore, *Althæa officinalis* and *Cotyledon Umbilicus*, the latter in immense profusion everywhere. On visiting Limerick, *Cœnanthe fistulosa* and *Cœ. Phellandrium* were gathered.

Proceeding to Galway, the party visited the Great Island of Arran; and on the limestone rocks of that island they found *Asplenium marinum*, *Ceterach officinarum*, *Adiantum Capillus-Veneris*, *Neottia spiralis*, a peculiar variety of *Saxifraga hypnoides*, *Secleria cærulea*, *Carlina vulgaris*, *Asperula cynanchica*, *Alsine verna*, *Cerastium arvense*, *Ulex nanus*, *Poterium Sanguisorba*, *Lycopus europæus*, *Haloscias scotica* [?], *Juniperus nana*, *Senecio Jacobæa* (without a

ray), and a very hairy variety of *Plantago Coronopus*. In the fields, there was great abundance of spurred rye. What effect the abundance of ergot had on the inhabitants, the party could not ascertain. Near Roundstone, the plants seen were *Daboecia polifolia*, *Erica mediterranea*, and *Eriocaulon septangulare*.

Between Roundstone and Clifden, *Erica Mackaiana* and *E. ciliaris* were got; and in the neighbourhood of the latter place *Carduus pratensis* and *Daboecia polifolia* were found, in great profusion, and with remarkably fine flowers; in Kylemore, it was found with white flowers. In the vicinity of Galway, *Nepeta Cataria*, *Ceterach officinarum*, &c., were collected.

Some of the party afterwards visited Belfast, and gathered *Rosa hiberna*, *Orobanche rubra*, and *Equisetum Mackaii*, *Newm.*

Plants were exhibited to the meeting by Mr. Evans, Mr. Stark, and Mr. M'Nab.

Several candidates for membership were proposed, to be balloted for at the next meeting.

DUBLIN NATURAL-HISTORY SOCIETY.

May 13, 1853.—Robert Callwell, Esq., in the chair.

Trichomanes speciosum.

Dr. Harvey exhibited specimens of *Trichomanes speciosum*, recently found in the Island of Valentia, by Miss Helen Blackburn, daughter of the Director of the Valentia Slate Establishment. This lady found it abundantly, amongst *Hymenophyllum Tunbridgensis* and *H. unilaterale*. The specimens which Dr. Harvey exhibited were of the Killarney form, and dissimilar to the Glouin-Caragh plants, which are distinguished in Newman's 'Ferns' as var. *Andrewsii*. Dr. Harvey alluded to the discovery, last year, of *Trichomanes speciosum*, in Alabama, U.S., and mentioned that a second species had this year been found in another part of America.

Mr. Kinahan took the opportunity of exhibiting several forms of *Trichomanes*, which appeared to him to be distinct. He mentioned their peculiarities and habits, and observed that some he found growing on the face of barren and almost inaccessible rocks, others in the shaded and moist crevices of dripping rocks; while other plants he found altogether growing in bog-mould.

Mr. Andrews observed that a variety of opinions had already been offered and entertained as to the species of *Trichomanes* found in the south-west of Ireland. The Killarney form of the frond was triangular, the lowest pinnæ being the longest, and tripinnated. The plants found in Glouin Caragh had the fronds lanceolate, the lowest pinnæ being the shortest, and bipinnated (var. *Andrewsii*, Newm.) The winging of the involucre also has been noticed as peculiar. It was of much interest to hear of such a discovery in so bleak and unsheltered a position as Valentia Island presented; and he thought the meeting with *Hymenophyllum Tunbridgensis* there equally interesting. Mr. Andrews said that he first found the *Trichomanes* at Mount Eagle, west of Dingle, a very rocky and barren locality. No doubt trees flourished, at one period, both at Mount Eagle and at Valentia; and *Trichomanes* might then have grown abundantly in those places. The Hon. Dayrolles De Moleyns had also discovered a station for *Trichomanes* near Dingle.*

THE PHYTOLOGICAL CLUB,
(*In connexion with the Pharmaceutical Society*).

June 6, 1853.—The President in the chair.

The Curators reported the receipt of several parcels of plants.

Structure of Galls.

Mr. Muskett presented a translation of a paper by M. de Lacaze Duthiers, intituled 'Researches upon the Structure of Galls,' published in the 'Comptes Rendus,' April 4, 1853.

The author commences by stating that former writers upon the vegetable pathological productions named galls, have only considered their forms, the plants upon which they are found, and the insects which cause them. Their structure and development have been completely neglected.

Galls are generally considered as purely cellular masses. This is an error, for they contain the principal elements and tissues which enter into the composition of plants. They may be divided into

* In Newman's 'British Ferns,' p. 309, it is recorded that this fern had lately been planted abundantly in Valentia Island.—E. N.

external and internal galls, from their relations to the vegetable which bears them. The first project outwards, and are only connected with the plant by a very small peduncle ; the second kind are developed within the tissues and organs they deform.

External galls are sufficiently naturally divided into unilocular and multilocular, from the number of cells which they contain.

The unilocular class may be divided into five groups, whose structure is more and more simple as it recedes from the first type. This type is represented by the large gall of commerce, and the French gall. If taken when fully developed, they exhibit, from the surface to the centre :—

1. Epidermis without stomata.
2. Cellular, subepidermal layer, analogous to the cellular tissue of vegetables, containing colouring matter.
3. Zone of irregular, ramose cells, with large cavities : the spongy layer.
4. Layer of hard, prismatic, dotted cells.
5. Layer of very thick polyhedral cells, very hard, much dotted, and forming the protecting layer to the nucleus.
6. Central alimentary mass of soft cells filled with liquid ; the external part containing starch-granules, colourable by iodine ; the internal, not producing this reaction.

The central amylaceous mass disappears gradually during the development of the larva, which does not commence its metamorphoses until it has consumed all the alimentary portion.

May the most internal portion be regarded as fecula modified by a process analogous to the commencement of digestion, or rather as matter more specially azotized, serving for the first phases of embryotic development ?

The French gall, like that of commerce, contains fibro-vascular bundles, which pass from the point of insertion towards the centre, and ramify in the interior of the parenchyma. We find in these bundles, fibres, branching and dotted vessels, and true spiral vessels. These disappear successively, and give the five groups of external unilocular galls before mentioned.

1. Hard and spongy : French gall, and gall of commerce.
2. Hard : spherical galls, on oak-leaves.
3. Spongy : cellular oak-galls, with regular tubercles.
4. Cellular : lenticular galls, on oak-leaves.
5. Protecting layer disappears ; the subepidermic cellular tissue only remains : spherical galls, on leaves of briar.

Compound or multilocular external galls are due :—

1. To cohesion of simple tumours, allied to the fifth group described above : briar-gall.

2. To the development of a hollowed, cellular mass. They may be compared with different groups of the unilocular, being sometimes hard (tumours on roots of oak) or spongy (oak-apples).

In all the external galls, whether simple or compound, the fibro-vascular bundles are placed on the outside of the protecting layers.

Internal galls are true or false.

True galls contain the insect in the interior of their tissues. They are hypertrophies, and have their seat upon all parts of the plant,—on the parenchyma, the nerves, the petioles, the cellular tissues, cortical fibres, medullary rays, and the pith.

False galls are hypertrophies, deforming the organs, and affording the insects protection and nourishment. But the parasites are always on the outside of the tissues of the plant. To this division belong the egg-masses of aphides found on the leaves of the poplar, lime, elm, &c., and the nodosities of the trunk of the apple-tree.

The vegetable hypertrophy, in whatever form of gall it develops itself, does not cause the disappearance of any of the organic elements : it increases their number and volume, and modifies their form.

The *cause* of external galls is the deposit of a liquid venom, with specific properties,—a true morbid poison, secreted by the insect, which deposits it in the plant with its egg. The form, consistence, &c., of the tumours vary with the specific properties of the virus of which they are the consequence.

Internal galls, and more especially the false, appear to owe their formation, as Reaumur has shown, to the abstraction of the liquids of the plants by the suction of the Aphides. This abstraction, in augmenting the vitality of the part, determines, also, its hypertrophied growth.

We could make a third general division, presenting at the same time the characters of external and internal productions ; *e. g.*, artichoke-galls.

The paper elicited considerable discussion.—*R. R.*

A Field Day of Naturalists, at Eastnor, Herefordshire.

A Naturalists' Club having been recently formed at Malvern, the Woolhope (Herefordshire) Naturalists' Club invited the newly-constituted body, together with the Cotteswold (Gloucestershire) Club, to

meet them, for an exploration at Eastnor, near Ledbury, on the 7th of June last. The united party accordingly, numbering upwards of sixty, mustered from their various localities at about 11 a.m., in the valley of the "White-leafed Oak," which is situated between two most southerly hills of the Malvern eruptive ridge, and at once proceeded to the business of the day. Professor Strickland (who occupies the mineralogical chair of Dr. Buckland, at Oxford) attended, by invitation, as an Honorary Member, and now proposed to point out, to those who took an interest in geological researches, the grand features of the country before them, and the relations of the Silurian strata with the Malvern syenitic rocks. He then led a large party to the summit of the Ragged-stone Hill, and to various quarries, where *metamorphic rock* was clearly shown, the result of the action of the eruptive rock on the Silurian deposits; and descanted, also, on the remarkable beds of sandstone in the Obelisk Hill, first noticed by Sir R. Murchison. A most instructive morning was thus passed among the rocks and glens of the southern Malvern range.

Meantime, an ardent band of botanists, including Dr. Bull, of Hereford, Mr. W. H. Purchas, of Ross, and other Woolhopean gentlemen, had placed themselves under the able direction of Mr. Edwin Lees, to gain some insight into the Botany of Malvern, attaching more value to the *clothing* of rocks, than to the naked ribs of mother earth, attended to by their friends. This party had a very interesting ramble among the deep shades of the Holly-bush Hill, where there are indigenous clumps of that tree many hundred years old, the bark covered with venerable cryptogamic crust. They next explored the curious and interesting rocky dingle called "The Gullet," where, darkling through the entrails of the strata, amidst a luxuriant growth of ferns and mosses, a burrowing stream gushes down a deep, densely-wooded ravine between the Holly-bush and Swenchard Hills. The botanical division next ascended to the Obelisk Hill, and closed a most agreeable day by visiting the celebrated *Mistletoe in the Oak*, in Eastnor Park, where Dr. Bull, officiating as Arch-Druid, climbed the summit of the tree, where the mistletoe flourishes in great force, and gathering some branches of the mystic plant, distributed them to his friends beneath, as mementoes of the expedition.

Late in the afternoon, the parties united at dinner at the Somer's-arms Inn, where Barwick Baker, Esq., President of the Cotteswold Club, filled the chair; and the Revs. T. T. Lewis, of Aymestry, and W. S. Symonds, Rector of Pendock, Presidents of the Woolhope and Malvern Clubs, occupied the opposite end of the table. After the

viands had been discussed, and customary toasts drank, the Rev. W. S. Symonds, thanking the Honorary Members for their attendance, made some admirable remarks on the uses of Clubs like their own, and dwelt on the value of Natural History as a part of education. He yet hoped that practical modern science would take its proper place in our universities; and he thought men were as well entitled to honorary distinctions for their powers of observation and research, well carried out, as for exercises in Greek, Latin, or the mathematics. These observations elicited general applause.

Papers were then read, by Edwin Lees, Esq., F.L.S., 'On the Plants of the Silurian Strata, and those peculiar to Limestone Districts, with Reflections incident to the Subject;' by the Rev. G. C. Davis, Vicar of Tewkesbury, 'On the Migration of Swallows;' and by Mr. Hewit Wheatley, of Hereford, 'On the Fishes of Herefordshire.' The paper of Mr. Lees, on the Silurian plants, led to a discussion, in which Professor Buckman, of Cirencester, Dr. Wright, of Cheltenham, and Mr. W. H. Purchas, of Ross, took part. Dr. Wright proposed that a chart should be formed of the country under their notice, showing the plants of each geological formation; and Mr. Lees, Professor Buckman, and Mr. Purchas were constituted a committee to carry out this idea. The party separated, much pleased with their reunion, and hopeful for another at no distant day.

Note on Epilobium Lamyi.

Mr. Syme has this morning sent me word that, since he wrote the note on *E. Lamyi* (Phytol. iv. 933), he has seen a specimen from Prof. Grenier, labelled '*E. Lamyi*,' with the remark '*Cult. ex sem. auct.*'; thus appearing to be indubitably the plant of Schultz. Mr. Syme says this is clearly identical with the plant which I labelled *E. virgatum*. In the absence of figures and authentic specimens, I will hazard no conjectures as to the synonymy, but content myself with observing that the discrepancy between my plant and the description, in the '*Flore de France*,' of *E. Lamyi*, as regards the existence of stolons, remains to be accounted for.—*W. H. Purchas; Ross, May 24, 1853.*

[This note was accidentally omitted from the Phytologist-Club Proceedings.]

Notes on the Localities of some Pembrokeshire Plants, observed in May and June, 1853. By EDWIN LEES, Esq., F.L.S.

ONE great advantage of a periodical devoted to British Botany is, to record "the living *flowers* as they rise," to correct former observations, record new localities, or the extension of the bounds of plants; and so keep the tide of research up to high-water mark. I have thus to mention an *alteration*, though not a correction, with respect to a recorded observation of my own. I have stated in the 'Botanical Looker-Out,' that the majestic ruins of Pembroke Castle were overgrown with the silver corymbs of the fragrant *Alyssum* (*Koniga*) *maritimum*. This relates to the observation of sixteen years ago; and the old dame who then was *custos* of the Castle, and used daily, at morn and eve, to furl and unfurl the banner upon the keep, assured me that, for the twenty years, or more, that she had patrolled the time-worn turrets, she had noticed the *Alyssum* growing there. Time and change will, however, mark the flight of years; for on my present visit to Pembroke not a single specimen could I find anywhere about the Castle; the flag-staff, too, had been blown down in a tempest, and not replaced; the old dame no longer mounted the ruined stairs of the keep; and plant and banner were alike numbered with the things that have been. I felt sorry for the loss of the plant, though, perhaps, only naturalized; but, a day or two afterwards, returning from Boshaston, by the opposite side of the town, I found the *Alyssum* growing, in several very luxuriant tufts, upon the weather-beaten town-walls; and, as there are still extensive remains of these, it will, doubtless, continue to maintain itself there.

Diplotaxis tenuifolia used to be rather abundant at Tenby, generally showing itself, as an old retainer, about domestic spots, even on the window-ledges of the ancient habitations. It is now almost gone, for the thick stone dwellings of the original Flemish settlers are nearly all gone too; and the present race of tall, lean, and hungry-looking white houses, overlooking the dejected walls of olden times, offer the plant no place of shelter suited to its recollections. I could now only find it on three, out of, perhaps, a score, of old places, still remaining relics of the past. Here it still tenaciously clung, in front of the thick casements, and will do so till the remorseless hand of innovation decrees their ruin.

Nature generally supplies some compensation for loss; and so, in place of the "time-honoured" *Diplotaxis*, a modern interloper has

sprung up,—*Centranthus ruber* ; and this red valerian now grows over walls and ruins with such rapidity, that upon buildings in South Wales it seems likely to become as much a pest in its onward spread upon land, as the *Udora* is in its incursions through the water.

I have, in a former communication, adverted to the *Aquilegia vulgaris*, as among the *ill-starred* plants that have a dubious light thrown upon them in the last edition of the 'British Flora,' by Sir W. J. Hooker and Dr. Arnott. I was particularly struck, this year, with the abundance of the columbine, both in Pembrokeshire and Caermarthenshire. In wandering around Pembroke, I found it quite general under hedges in shady lanes, in several directions, as well as at Penally near Tenby, and on the road to Haverfordwest, from the latter place ; nor could I see any reason to believe that it was less a true native than *Hypericum Androsæmum*, springing up by its side, which no one has suggested to be an introduction. Possibly the *Aquilegia* may have increased of late years ; but for such a general West-of-England plant, it surely seems strange for the authors of the 'British Flora' merely to speak of its occurrence "in several places," and brand it as not a genuine native. It may be, therefore, well to record, that on the road from Haverfordwest to Caermarthen (and in the latter county), between a place called "the Roses" and the village of St. Clear's, the columbine occurred in large patches, at intervals, for three miles ; and in one gorsy upland, in particular, was dispersed among the gorse-bushes (*Ulex Europæus*), in every part of the heathy field, making one of those floral pictures, bright with colouring, that so long repose upon the memory.

A few plants may be mentioned, in connexion with the vicinity of Tenby, about the Castle-rocks of which now flourish the most exuberant growth of sea-cabbage (*Brassica oleracea*) and *Smyrniûm Olusatrum* that ever met my view. Whether this was so previous to the occupation of the Castle, is, perhaps, worth the discussion of those who would pry curiously into the first immigration of plants considered to be "doubtfully wild," or, "perhaps only escaped from cultivation." It is an interesting ramble, passing through the singular western portal of Tenby, down the Windmill Hill, and across the sandy Burrows to Giltar Point, and the broken limestone rocks there forming the barrier of the coast. Numerous hills and hollows, with intervening spreads of sand, make the track a devious one ; and some isolated masses of rock, half covered with ivy, and, where bare, deeply tinted with the orange-coloured *Parmelia elegans*, give a picturesque aspect to parts of the scene ; while an old, solitary watch-tower near

Penally, bare as a withered stump, sends the imagination far back, among warring thoughts. Just at this time, the *Rosa spinosissima* was coming into flower; and its dwarf bushes covered many of the rising undulations with a close covering, now scattered over with stainless globes, for thus the flowers appear, the petals converging together at their first expansion. Finely contrasting with these milk-white globes, are burning bushes of *Ulex Europæus*, patches of flaring *Lotus corniculatus* and *Ranunculus bulbosus*, the azure of the trailing *Veronica*, and the deep purple of a considerable quantity of *Orchis Morio*; all contributing their bright colours as a foreground to the bare sand-hills, just roughly fringed with stiff, glaucous grass, or tufted with the pallid sea-spurge. In some places the ground was tinged with vivid red, from the viscid stems of a gregarious growth of the little *Saxifraga tridactylites*, which else would have been invisible. Here and there was a deep, round hollow, formed, years ago, by some on-rushing wintry billow; but where the creeping *Salix fusca* had now found a home. At intervals, stiff clusters of the great sea-rush (*Juncus acutus*) took up a position; and everywhere *Avena pratensis* waved its elegant silky panicles in the breeze.

At the extreme western end of the Burrows, beyond Penally, a freshwater marsh stretches inland, but now gradually impinged upon, and likely to be finally obliterated, by the attacks of cultivation. Here the beautiful *Menyanthes trifoliata*, become a comparative rarity, was displaying its fringed petals by the deeper spreads of water; and, after some floundering among hussocks of *Carex paniculata*, I detected the rising fronds of *Osmunda regalis*, only, as yet, in a barren state. Here, also, in this spongy part of the marsh, I gathered *Lastrea Thelypteris*, but without fructification. Plenty of *Carex intermedia* was here scattered about, and some very fine, tall plants of *C. ampullacea*. In parts of this boggy ground the fragrant *Myrica Gale* grew very thickly; and at a later period, doubtless, other interesting bog-plants might be found.

The promontory of Giltar Point rises abruptly from the western termination of the Burrows, in a long ridge of carboniferous limestone, which extends along the coast for some distance, till it meets with the old red sandstone near Manorbier. Of course, it offers a pabulum for the usual limestone plants; but the turf along its summit swarms with the pretty and fragrant *Scilla verna*; thus giving quite an azure foreground to the scene of shelving rock, sea, and craggy island. The *Cochlearia officinalis* here grows very fine, with some quantity of *Thalictrum minus*, if not, perhaps, rather the var. *majus*, as far as size

is concerned. Further on, but still on the summit of the cliffs, the wandering botanist is excited by the appearance of several beds of wild *Asparagus* (*Asparagus officinalis*); the stems all in a prostrate state, and many of them intricately entwined together. The plant was now just coming into flower. Beyond these *Asparagus*-beds, among the broken cliffs, that, like a breached fortress, form a glacis towards the sea immediately opposite to Margaret's Island, *Inula crithmoides* grows sparingly; and I only observed it in this spot. Still following the indented coast-line towards a little bay, several yawning "cauldrons," as they are locally called, present themselves, in the shape of deep cavities, somewhat like lime-kilns, but on a larger scale, where the ground has fallen in, and frequently communicating with the sea, by an arched passage. These, being without any protection around them, should be noted, as they must be dangerous to any stranger returning in the dusk, or disguised by a fog. The cliffs rise to their loftiest point above the sandy bay of Lydstep, forming a perpendicular mural wall, not easily explorable. The face of this had upon it a dense, but dwarf, growth of privet and ivy, among which I gathered several specimens of *Orobanche Hederæ*. On the hill close to Manorbier, the *Ulex Europæus* forms such a close shell-like covering to the high ground next the sea, leaving no margin whatever for the foot, that it was next to impossible to penetrate it. The fatigue, at any rate, in a hot sun was too great, and I gave it up. Some plants that I remarked at other times, in the course of my walks, may be mentioned, as below; for there seems to me utility in making records of vegetable appearances, at different times, as they come under the botanical eye.

Ranunculus parviflorus. Plentiful in arable fields on the cliffs opposite Ramsay Island.

Matthiola incana. This was growing on a wall at Pater, near the sea; probably naturalized there: but, as it is very seldom seen on walls, it may suggest whether or not to be found on rocks of the craggy Pembroke coast. *M. sinuata* has been mentioned by the late Mr. Adams as growing "near Pembroke."

Cheiranthus Cheiri. Quite covering an isolated mass of rock on the shore in front of the terrace at Tenby, and the adjacent rocks; doubtless naturalized, yet looking more in the character of a native than I have anywhere seen it.

Arabis hirsuta. Growing plentifully in the sand of the Burrows, which it seemed to prefer to the rocks.

Cochlearia officinalis, and vars. Very large and fine at Giltar

Point. Var. *Groenlandica* on the rocks. Var. *Danica*, with purple flowers, on the town-walls.

Lepidium rudemale. I noticed a considerable quantity of this plant, growing dwarf upon a very hard limestone-wall at Penally, near the Backwater.

Senebeira didyma. At the bases of walls about Pater.

Raphanus maritimus. On the precipitous rocks at Lydstep, west of Tenby.

Saponaria officinalis. About Penally, on the Pembroke road.

Cerastium tetrandrum. Most abundant on the rocks and walls. Stem, pedicels, and sepals so densely hairy and viscid, that they become loaded with particles of sand blown upon them; thus looking strangely disfigured.

Lavatera arborea. I inquired at Pembroke for the craigsman who had formerly got this plant for me, from the Great Stack Rock; but was sorry to hear that, in collecting eggs, he had slipped from his high position, literally smashed to death; and no successor had been found to fill this dangerous post. The *Lavatera* did flourish profusely on the isolated Elyange Stack; but the billows appeared to have so degraded it, that I could not at this time see the plant anywhere about. I was informed it grew abundantly on rocks called "The Bishop and his Clerks," near Ramsay.

Hypericum Androsæmum. Near Penally, St. Petrax, and Stackpool.

Erodium maritimum. On Caldy Island.

Medicago maculata. Among the turf on the rocks above the Norton Sands.

Vicia lathyroides. In a stony field east of Waterwinch.

Trifolium scabrum. On Windmill Hill, Tenby.

Prunus Avium. Not uncommon in hedges about Tenby and Pembroke, and St. Clare's, in Caermarthenshire.

Ribes Grossularia. Numerous seedlings among thickets at Penally; whence derived, I know not.

Petroselinum sativum. In crevices of the rocks of St. Catherine's Isle, near the ruined chapel. This is a true naturalization, very different from a stray plant on a garden-wall. Doubtless it has been here from Catholic times, when some anchorite "from youth to age" performed his daily orisons, and cultivated the barren rock. The plant must be well known here traditionally, for I observed a group of joyous children bounding among the cliffs, to gather the parsley.

Asperula Cynanchica. On the turf near Giltar Point, rather sparingly.

Hieracium cæsium. Among the rocks at Giltar Point.

Antennaria dioica. On the turf near the old watch-tower, where some broken rocks indicate the ancient boundary of the Tenby Backwater.

Inula crithmoides. Among broken rocks west of Giltar Point, just opposite to Margaret's Island. Abundant at this one spot.

Conyza squarrosa. Between Penally and Manorbier.

Matricaria maritima. On the rocks between Bosherton Meer and St. Gowan's Chapel. I observed it nowhere else on this coast. Even to superficial view, the wider-spreading flower of this plant has a much more handsome appearance than that of *M. inodora*. Leaflets broader and shorter, inflated at their edges, the petiole channelled and polished.

Ligustrum vulgare. Abundant on the rocks of the Pembroke coast; though the authors of our *Floras* confine it to "hedges," whence a doubter might suggest it as "probably introduced."

Myosotis collina. Very small, but pretty, on St. Catherine's Isle, and other parts of the coast-line.

Veronica montana. Stackpool woods, near Pembroke.

Catamintha Acinos. On Windmill Hill, Tenby.

Statice binervosa. On rocks west of Giltar Point, but in small quantity.

Euphorbia Portlandica. Near the Backwater, at Tenby; and on Caldy Island.

Althium oleraceum. Among rocks on the descent to the sea, from the Windmill Hill.

Neottia spiralis. On the sandy shore of the Backwater.

I only intend, in this paper, to note the vegetation that fell under my own view at this particular time. Such notices, by competent botanists, are, I think, advantageous; because changes are always in progress, more or less influencing the continuance, or causing the banishment, of particular species of plants. The Backwater at Tenby is now partially drained, and inclosed by stone-walls, to the detriment of its pristine beauty; and while I was there the northern side of the Barrows themselves was invaded, and columns of smoke daily trailing heavily over the ground, from heaps of smouldering gorse and withering plants; appearing, to a botanical eye, like the destruction and desolation of a battle-field.

EDWIN LEES.

Cedar Terrace, Henwick, Worcester,
July 11, 1853.

Extracts from the 'Proceedings of the Linnean Society.'

(Continued from page 859).

On the Development of Ferns from their Spores; by A. Henfrey, Esq.

The author commences his paper by referring to the remarkable discoveries published by Count Leszczyc-Suminski in 1848, and the observations to which they have subsequently led on the part of others; which appear to necessitate important changes in our general views of the reproduction of plants. He finds, however, that the results of some of these later observations differ in many respects not only from those of Suminski, but also among themselves; and that opinions are divided both as to the actuality of the most important fact of all, *viz.* the process of impregnation, and as to the period and circumstances of its occurrence. Under these circumstances he has thought he would be performing a useful task in subjecting the question to minute investigation, in the course of which he has carefully traced the development entirely through its course from the spore to the young leafy plant, applying every available means to clear up the anatomical conditions in each stage of the progress. The drawings which accompany the memoir were nearly all made by means of the camera lucida eye-piece, so that they represent preparations actually seen.

The subject is treated of under three heads: the first section containing the author's own observations; the second, a critical examination of those of preceding authors; and the third, a few remarks on the general bearing of the results upon vegetable physiology.

Under the first head, Mr. Henfrey describes first the prothallium, and its mode of growth, enlargement and decay; secondly, the antheridia, with their sperm-cells and spermatozoids; thirdly, the archegonia, with their papillæ and embryo-sacs; and fourthly, he gives his own view of the development of the embryo. On all these points he enters into much detail, tracing the several stages of the process with great minuteness. In his criticism of previous observations, he passes in review the facts and opinions stated by Nägeli, Suminski, Wigand, Thuret, Hofmeister, Schacht, Mettenius, Von Mercklin, and Hofmeister again; and indicates the points in which he himself either coincides with or differs from each of them. The memoir is so completely one of detail, that under these two principal divisions it would be difficult to give a sufficiently clear abstract without running to too great

a length; and this is the less necessary as the memoir itself will immediately appear in full in the Society's 'Transactions.'

Under the head of "Development of the Embryo" the author gives the following statement of his opinion on the question of impregnation, and the mode in which it is effected:—"My opinion with regard to the fertilization is, that the operation is effected by the contact of one or more *spermatozooids* with the mucilaginous filament contained in or hanging from the mouth of the canal of the *archegonium*. I have seen the *spermatozooids* swimming in numbers around the mouths of *archegonia*, but never detected one inside, and I do not see any good reason for supposing such a process necessary. The pollen-tube of flowering plants only comes in contact with the outside of the embryo-sac, and the influence is sometimes communicated through a long suspensor; and there does not seem to be any sufficient objection to the supposition, that the contact of the *spermatozoid* with the filament of mucilage which lies in the canal of the *archegonium*, suffices to convey the necessary stimulus. I imagine this stimulus resides in the mucilaginous fluid in which the *spermatozoid* is bathed in the *spermi-cell*, and which, adhering to this, is conveyed to the mucilage (protoplasm) of the *germinal vesicle*, just as the contents of the pollen-grain become combined with the protoplasm of the germinal vesicle in flowering plants. The nature of the process is clearly a problem beyond the reach of science, but it seems to me a necessary induction from the facts in the Phanerogamia, that the phenomena result there from the material union of two fluids, and I hence conclude that this is the case here. The comparatively few cases of successful impregnation among these *prothallia*, so many of which prove sterile, may perhaps be accounted for by the peculiar conjunction of circumstances required to bring a sufficient amount of the fertilizing fluid, by means of the *spermatozooids*, to the *germinal vesicle*, at the precise epoch required."

His general "conclusions" are as follows:—"In summing up all these statements it becomes evident that the balance of evidence is in favour of the existence of sexual organs, and of a process of impregnation, giving rise to a new individual, as asserted by Suminski, although under conditions somewhat different from those described by that author. Only two of the observers who have repeated his investigations throw doubt upon these points, namely, Wigand and Schacht; the statements of the former as to matters of fact are far from sufficient to bear out the mass of argument he has built upon them against the existence of sexes; in fact, his observations were so.

imperfect that he described the two parts of the *archegonium*, the *papilla* and the enlarged *embryo-sac*, as distinct structures; while he never traced the origin of the new plant at all. His observations may therefore be safely passed over. Schacht's are more complete, but he again only *argues* against the probability of a sexual conjunction, with the preconceived notion that this must be analogous to what he erroneously believes to be the conditions in the Phanerogamia; while his observations furnish facts which greatly support the probability of an impregnation by the *spermatozoids*; the difficulties he suggests being of little weight in comparison with those of accounting for the existence of all the peculiar structures by any other hypothesis. The opinions of all the rest are in favour of the impregnation (Thuret does not treat of the *archegonia*), and the differences between them, except in the case of Suminski, are unimportant in a physiological point of view, merely presenting questions of anatomical and morphological interest. And since Suminski's description of the mode of origin of the embryo would be altogether at variance with what exists, not only in other plants, but also in animals, and is opposed to the observations of all the rest of us (except the doubtful support given by Von Mercklin), I cannot but repeat my belief that he was led from the facts by his imagination being preoccupied by Schleiden's doctrine of the impregnation of the Phanerogamia."

On Venation as a generic character in Ferns; with Observations on the genera Hewardia, J. Smith, and Cionidium, Moore; by Thomas Moore, Esq., F.L.S., Curator of the Botanic Garden, Chelsea.

The object proposed by the author is to inquire—1st, into the general importance of modifications of the vascular structure of the fronds in distinguishing the genera of ferns; and 2ndly, into their relative value in the cases instanced. He begins by referring to the numerous authors by whom the venation has been turned to account in the formation of genera or subgenera, and in particular to the observation of Mr. Brown, that "for subdivision, the most obvious as well as the most advantageous source of character seems to be the modifications of the vascular structure, or the various ramifications of the bundles of vessels or veins of the frond, combined with the relation of the sori to their trunks or branches." He notices an instance in which Sir William Hooker has given generic importance to this

character of venation alone, *viz* in *Dietyoxiphium*; while in *Schizoloma* he regards the venation as only of subgeneric value; and he treats it as a mere question of words, to be decided by convenience, whether or not this character should be generically employed. In the case for instance in reference to which Mr. Brown's remarks were made, *Polypodium* (*Dipteris*) *Horsfieldii*, it seems to him, as a matter of convenience, a much simpler and more easily comprehensible idea, to regard *Dipteris* as a group of ferns with round naked sori, dichotomous primary veins and reticulated venules, than to have to recognize in *Polypodium* (a genus of ferns having round naked sori) an included group called *Dipteris*, in which the primary veins are dichotomous and the secondary reticulated. In most cases, indeed, he regards subgenera as at the best but cumbrous contrivances.

Looking at the question of venation, as illustrated in the great and universally adopted natural divisions of flowering plants, he thinks its generic importance in ferns rests on better grounds than convenience alone. In the case of flowering plants the presence of complete floral organs affords the necessary diversity for generic distinction; but as an equivalent to these we have in ferns nothing more than certain naked or covered aggregations of spore-cases, which in the great bulk of the species scarcely afford any differential characters, or such only as are microscopic, and therefore not to be resorted to until all more obvious features are exhausted. But peculiarities in the venation of ferns are for the most part associated with peculiarities of habit; and since it appears quite justifiable to employ other characters than those derived from the fructification in distinguishing generically such groups as the ferns, in which the fructification affords comparatively so little variety, what is there so constant and unvarying, and at the same time affording such diversities, as the peculiarities in the development of the vascular structure? Experience, moreover, attests this character of venation as one to be relied on with perfect confidence, because (with very insignificant exceptions) whatever modification of vascular structure is met with in a particular species, that and no other is found in that species. The author concludes, therefore, that without lowering the importance of the fructification of ferns in distinguishing generic groups, the modifications of venation are properly as well as conveniently admitted to share in the same office.

Passing to the question, whether a reticulated venation is in itself a sufficient generic distinction among the ferns, he determines it in the affirmative, inasmuch as a genus being in his view an arbitrary group, all that is really required as a generic character is a constant diffe-

rence from established genera in the structure of some important organ or system of organs. Now the vascular system must be regarded as of the highest importance in the vegetable economy even in reference to propagation, it being not at all infrequent to meet with extraordinary means of development in connexion with it, *viz.* adventitious buds; and in ferns particularly those points of the veins which serve in normal cases as the receptacles to which the sori are attached, in other cases become viviparous and develop gemmæ from which new plants are produced. He believes, moreover, that characters derived from this system of vessels, when taken in connexion with the fructification, though sometimes forming groups of considerable extent, and occasionally separating species having some external similarity, nevertheless in no case bring together obviously ill-assorted species, but rather associate those of obvious similarity and affinity.

For these reasons he is not prepared to follow Sir W. Hooker in setting aside the genus *Hewardia* of Mr. John Smith. He regards the difference as broad and important between the accidental anastomosing of contiguous venules which occurs in some species of *Adiantum*, and a constant and complete reticulation, such as exists in the genus *Hewardia*; and he concludes that that genus should be retained. This conclusion he finds unexpectedly confirmed in *Fée's* 'Genera Filicum,' just received in this country, where the same view is taken of the species of *Hewardia* as that which he had previously adopted, and an additional species (*H. serrata*) mentioned, of which he had no previous knowledge.

The species enumerated by the author are arranged as follows:—

* Sori continui; venæ primariæ costiformes.

1. *Hewardia adiantoides*, *J. Smith* = *Adiantum Hewardia*, *Munro*.
2. *H. dolosa*, *Fée* = *Ad. dolosum*, *Kunze*.

** Sori interrupti; venæ uniformes.

3. *H. Le Prieurei*, *Fée* = *Ad. Le Prieurei*, *Hook.*
4. *H. serrata*, *Fée*.

Mr. Moore regards *H. Wilsoni*, *Fée* (*Adiantum*, *Hook.*), as a true *Adiantum*; as also Sir W. Hooker's variety γ of *Ad. lucidum*. In both these the dichotomous veins occasionally anastomose; but there is nothing like complete reticulation, and the union, when it does occur, is evidently accidental. If the name *Hewardia* be retained, as the author proposes, for the

genus of ferns to which it was first applied, he suggests that of *Iso-physis* for the *Melanthaceus* genus, subsequently so called by Sir William Hooker in his '*Icones Plantarum*,' t. 858, the species retaining the name of *Tasmanica*.

The same rule induces the author, in the second case referred to, to separate from the genus *Deparia*, Hook., a species having a truly and constantly reticulated venation, that of *Deparia* being uniformly free. The species in question is *Deparia Moorii* from New Caledonia, named by Sir Wm. Hooker after Mr. C. Moore, the Director of the Sydney Botanic Garden, by whom it was discovered; and the following are its generic characters:—

CIONIDIUM, *T. Moore in Gard. Comp.* (nomen tantum).

CHAR. GEN. *Venæ reticulatæ. Sori semi-globosi, extra-marginales, in venularum apicibus excurrentibus pedicellati; capsulis pedicellatis. Indusiu stipitata, subcylathiformia.—Frondes bipinnatæ; soris ex utraq[ue] pinnularum pinnatifidurum margine prominulis.*

Cionidium Moorii, *T. Moore*, l. c.

Deparia Moorii, *Hook. in Journ. of Bot.* iv. p. 54; t. 3.

Hab. In Novâ Caledoniâ, *D. C. Moore* (1851).

Note on the Nature of Fasciated Stems; by the Rev. William Hincks, F.L.S., Professor of Natural History in Queen's College, Cork.

The author lays it down as an indubitable principle, that what we call monstrosities or anomalies, either in the animal or vegetable kingdom, are always susceptible of explanation from the operation, under unusual circumstances, of causes or principles the ordinary operation of which produces the normal structure of the species. Hence they are always worth studying until a satisfactory explanation of their nature has been arrived at, and even when that is accomplished they have still an interest as illustrations of principles which we apply in the explanation of normal structures, or as proofs of the truth of particular views in respect to the origin or relations of parts in certain tribes. In accordance with this view of the importance of such investigations he proceeds to the consideration of the nature of fasciated stems, which, in concurrence with the view taken by Linnaeus in his

'Philosophia Botanica,' he is disposed to regard as formed by a group of coherent stems. According to this view the real peculiarity would consist in the number and remarkable arrangement of the buds, the coherence of stems brought together in such a relative position being, as shown by innumerable examples, a matter of course. Having regard to the crowded or unusually placed buds which are found in the anomaly called *plica*, tracing this cohesion upwards from the not uncommon adherence of two stems, and observing what must necessarily happen from numerous branches occurring together, it seems to him that the *fascia* is by no means difficult of comprehension. The *strizæ* which it almost invariably presents exhibit the traces of the lines of junction; and the curved or spiral contraction, which is so often met with, is perhaps accounted for by the growth in connexion with each other of internodes of unequal length. He would not, however, affirm that every stem which is called fasciate is composite in its nature; for that term has been extended to cases of riband-like expansion, which, although dependent also on excess of nourishment, are distortions of a single stem.

Mr. Hincks then refers to the objections taken to the theory of Linæus by several recent physiologists, and most clearly and explicitly stated by M. Moquin-Tandon in his '*Téatologie Végétale*' under the following heads:—1. "We find plants with a single stem fasciated (as *Androsace maxima*), and nothing announces to us that we have in this case several individuals united together." 2. "On certain fasciated stems we may remark that the branches are of the same number and the same arrangement as in the normal condition." 3. "Two branches accidentally united in the direction of their length form a body of which the transverse section presents a figure more or less resembling a figure of 8, if the coherence is recent or slight, and an elliptic or rounded figure if it is of long standing or very intimate: traces of two medullary canals are almost always found. In a fasciated stem the section gives an elongated figure in which we commonly observe only one compressed canal." 4. "To obtain a fasciated stem by coherence a great number of united branches would be required; but, though an accidental union of two branches or of three may be admitted, it is very difficult for it to occur at the same time among four, five, or six. It is very difficult to suppose that these branches should all meet longitudinally, and that the union, instead of taking place around the central axis, should be entirely in one direction." 5. "If fasciated stems were the result of many combined branches, we ought to find cases in which the union is incomplete, and to be

able to observe on their surface such a distribution of leaves or buds as would announce the fusion of many partial spirals or verticils."

Setting aside the anomalies before alluded to, and guarding against the assumption that mere adherence explains an appearance which chiefly depends upon a peculiar position of buds and the production of numerous branches in a certain relation to each other, Mr. Hincks regards these arguments as not possessing any great weight. In regard to the 1st he remarks, that herbaceous plants which have usually but a single stem, not unfrequently produce several, which often remain distinct, but their union into a sort of fasciated stem is by no means uncommon. In proof of this he showed specimens of *Primula vulgaris* and *Hieracium aureum*, exhibiting the union of two stems so produced, and of *Ranunculus bulbosus* showing still greater complexity in the stem, while the principal flower appeared to be made up of two or three combined. The 2nd objection may appear in certain cases to be just, but the author is of opinion that it is hazardous to conjecture that we have no more leaves present in a fasciated stem than we should have in the same space in an ordinary one, and he referred to specimens on the table as distinctly proving that an increased number of leaves and buds is a general character of fasciated stems. M. Moquin-Tandon himself has, indeed, referred to an instance in *Bupleurum falcatum* where the leaves had been whorled, doubtless, Mr. Hincks observes, from those belonging to two or more stems being collected together. The 3rd argument he regards as very deceptive, for the nature of the transverse section presented by coherent stems must depend not only on the intimacy of their union, but also on the internal structure of the stems themselves. When two flowers adhere without much pressure, they exhibit uniting circles somewhat resembling a figure of 8, but when more completely combined they have one circumference of a much-elongated figure, and something similar is to be expected in herbaceous stems. Even the elongated pith of a transversely cut woody fasciated stem only marks the intimate union of several branches; and the author has noticed instances of the union of two and only two stems when the internal appearance was the same as in other fasciations. The 4th objection is derived from the improbability of the lateral union of many stems; but in addition to the common examples of the union of two stems, the author appealed to a distinct case of a union of four flower-stems of *Scrophularia aquatica* so complete that a composite flower was formed containing all the parts of the four component flowers, and produced a fasciated stem of *Ranunculus bulbosus*, where the union

of several stems terminated in a flower having at least double the usual number of parts, as indisputable evidence of the fact. He also laid before the meeting examples of numerous branches laterally arranged as if ready to combine, in immediate connexion with fasciated stems, which, according to his view, are made up of similar branches already combined. To the 6th and last objection he answers that cases in which the adherence is incomplete, and on which the marks of fusion of several stems are to be perceived, are in fact frequently met with, and may be appealed to as strong direct evidence in favour of the Linnean theory. A striking example is given in DeCandolle's '*Organographie Végétale*' (pl. 3, f. 1) in a stem of *Spartium junceum* having several branches only imperfectly fasciated; and similar specimens of *Aucuba Japonica* and *Cotoneaster microphylla* were exhibited, together with a fasciated ash, in which the traces of numerous stems were observable upon the surface.

The author stated his conclusion to be, "that the fasciated stem is best explained from the principle of adherence, where, from superabundant nourishment, especially if accompanied by some check or injury, numerous buds have been produced in close proximity; and that the supposition of a leaf-like expansion of the elements of a single stem is insufficient to explain the usual appearances, and is founded on a false analogy between fasciated and certain other anomalous stems."

The specimens exhibited were from a collection formed by the author and now in the Museum of Queen's College, Cork. They consisted of—1, an intimate adherence of two stems of *Bunium flexuosum*; 2, an entire adherence of two stems with their heads of flowers of *Hieracium aureum*, and of two or more stems of *Primula veris*; 3, a fasciated stem of *Ranunculus bulbosus*, with the terminal flower formed by the union of two, and the stem showing other signs of composition; 4, a fasciated stem of *Cheiranthus Cheiri*, apparently consisting of at least three united branches; 5, a fasciated stem of *Veronica maritima*; 6, two stems of the same plant, in which the buds which usually produce individual flowers have produced secondary stems themselves flower-bearing, so as to transform a simple into a compound spike; 7, a fasciated stem of *Aucuba Japonica*, seeming to prove the composite nature of such stems; 8, a fasciated stem of *Cotoneaster microphylla*, in which the composite structure is peculiarly evident; 9, a fasciated stem of *Fraxinus excelsior* showing a crowd of buds and of small branches in a linear series at the extremity of fasciated portions, and also showing the curved contraction of

North Devon."—*G. Maw; Barrett's-Hill House, Broseley, Salop, July 21, 1853.*

THE PHYTOLOGICAL CLUB,
(In connexion with the Pharmaceutical Society).

July 4, 1853.—Robert Bentley, Esq., F.L.S., &c., in the chair.

A donation of British plants, from Mr. Braithwaite, was announced; also a capsule of a species of *Gossypium*, from Mr. J. Fordham, jun.

Udora Canadensis, &c.

The President presented some specimens of the *Udora Canadensis*, in flower, taken from the lake in the Royal Botanical Gardens, Regent's Park. [After describing the extraordinary increase of this aquatic, as already detailed in the 'Phytologist,' and in confirmation of previous accounts,] Mr. Bentley stated that, about three years since, a plant accidentally found its way into the lake in the Gardens of the Royal Botanical Society. This had multiplied to such an extent, that at the present time there was scarcely a portion of the lake to be found which was not matted with it. As the female flowers were alone known in this country, this increase is extraordinary, as it must take place almost entirely by the formation of buds in the axils of the leaves; each being capable of forming an independent plant, when separated from its parent. Every fragment, therefore, into which the plant might be readily divided was capable of developing a new one; so that, like that pest of the agriculturist, the common couch-grass, the more it was disturbed, and cut up into pieces, the more rapidly did it spread, as by such means the separated portions were only placed in more favourable circumstances for their propagation; and hence, also, the difficulty, indeed almost impossibility, of eradicating it from those places in which it had become established. Mr. Bentley, therefore, particularly cautioned botanists to be very careful not to introduce it into any waters where its increase might be attended with injurious results.

Mr. Bentley also exhibited the following specimens:—

1. A leaf-bearing branch, and the fruit, of the *Myrospermum* of Sonsonate. He stated that this plant had been fully described by the late Dr. Pereira, in the 'Pharmaceutical Journal,' vol. x. p. 280, as one of the sources of the common black balsam of Peru, the white balsam, and balsamito. The specimens shown by Mr. Bentley were

obtained from the same source as Dr. Pereira's, namely, from Mr. Skinner, to whom botanists and pharmacologists were under great obligations, for the trouble he was always ready to take to facilitate their investigations.

2. The spadix, with flowers and fruit, of the *Coloeasia odorata*. The leaves of this plant, and those of allied species, although very acrid when fresh (like most of the plants of the natural order Araceæ, to which they belong), when boiled are commonly eaten in some tropical countries; and from their corms a nutritious soup is prepared.

3. The flowering stem and fruit of *Thalia dealbata*, natural order Marantaceæ. These two latter specimens were obtained from the Royal Botanical Gardens.

4. A portion of *Hydrodictyon reticulatum*, under the microscope, showing the movable spores, &c.

Portland Arrow-root.

The following paper, 'On Portland Arrow-root,' by Mr. T. B. Groves, was read.

In the course of lectures on Materia Medica, of the Pharmaceutical Society, delivered in the session of 1850-51, by our distinguished Professor, Dr. Pereira, he mentioned some facts relative to the manufacture of Portland arrow-root, which led me to infer that he considered it was carried on to a considerable extent by the inhabitants of the Isle of Portland. Living within a short distance of the island, I have thought it desirable to make some inquiries, to ascertain to what extent it is at present carried on. Dr. Pereira probably derived his information principally from an article in the Transactions of the Society of Arts, vol. xlv (1797), in which it is stated that, in the year 1797, the gold medal of the Society was awarded to Miss Jane Gibbs, of Portland, for producing a sample of starch, for economical purposes, from materials unfit for the food of man. The starch of arrow-root, as it is usually called, was prepared by her, by crushing in a mortar the corms of the *Arum maculatum*, stirring the mass with water, and straining off the liquor, from which the fecula was allowed to subside; this was again washed, and afterwards dried. She stated, and the statement is confirmed by the then Rector of the island, that she had in her possession 12 cwt. of the starch, and was ready to supply any quantity of the same, whenever required, at 11s. per cwt. Although there is no doubt that the quantity of the starch manufactured was much greater at that time than the present, yet its manufacture was never of much importance. It is now almost

extinct, and the arrow-root never seen out of the island, except in the hands of the curious. From my inquiries, I have learned that, many years ago, it was customary to crop the land only, every other year, allowing it to remain fallow in the intervening period; and that in the fallow fields leave was given to the inhabitants to dig for the roots. This custom has been abandoned, and the usual system of rotation of crops introduced. The common use of late years, has been much infringed upon by the government, for public purposes, and also by speculators, for quarrying for stone. These causes have very much interfered with its manufacture; so much so, indeed, that a few years since, wishing to procure a sample for a friend, to illustrate a lecture on dietetic articles, I found it very difficult to obtain even half a pound of it. Within the last week I have ascertained that one old woman is the only person who now prepares it; and she gives as her reason for doing so, that 'poor folks, now-a-day, are glad to turn an honest penny any how.' At the present time, the Arum is not very plentiful in the island, although there is still a vast extent of land that will never admit of cultivation, on account of its stony character, which, doubtless, produces most of the small quantity now obtained. With the exception of the old woman previously mentioned, liberty is not now obtained to dig in the cultivated fields and pastures. The Arum maculatum is commonly called arrow-root, or starch-root; but the vulgar names, 'cows and calves' and 'lords and ladies' are also known, though not so frequently used. The proper season for collecting the corns is when the plant has perfected its growth. This is generally in the months of May and June. Those which are collected in May yield a much less proportion of starch than those collected later. The fresh corn is extremely acrid, producing a most disagreeable tingling and pricking sensation in the mouth, when chewed. This acidity, I found, was not completely removed by drying. Lindley states that the corns are edible, when deprived of this acidity by boiling; but I have never known them so used. Their acidity renders it necessary to bruise the corns in a stone mortar, and to avoid, as much as possible, handling them, until after they have been washed. The process now employed for the separation of the starch is the same as that described by Mrs. Gibbs. The corns yield, according to Mrs. Gibbs, 4 lbs. of starch to the peck. My informant tells me she obtains, on an average, 18 lbs. from a peck of corns; none in June less in May. During the whole season, she considers three dozen lbs. to be a good average quantity, to be obtained for what she calls 15. 40 per cent. It is highly valued by the Dutchers,

who say that it is good for the people and looks, when prepared, very different from the arrow-root of the shop, which I have compared it with. Berlioz and I went to the island and find that it does not make either so clear or so fine a jelly, but is perfectly good for use as a substitute for arrow-root. The granules, when viewed under a microscope, appear of an irregular spheroidal shape, varying in size, but are, on an average, much smaller than ordinary starches, except rice starch. The milk is not only distinctly marked, appearing plainly only in the larger granules. The Portland arrow-root is, I believe, only made from the root of *Potamogeton*. Although there is an abundance of the *Arum* on some of the commons near Weymouth, yet the country people do not appear to know that it is of any use. This will doubtless appear strange to those unacquainted with Portland, but when we consider that, until within a few years, the Portlanders have kept themselves, as much as possible, aloof from the rest of the world, even forsaking their friends who dared to marry out of the island, and not permitting a stranger to settle amongst them, we can no longer wonder that they have kept their knowledge to themselves. They are probably a race of entirely distinct origin from the inhabitants of the mainland. Even now they use words which are not understood by us. This arrow-root has been prepared by them from time immemorial; and it is very probable that, living on a barren island, and depending principally on fish, they may have been compelled by necessity, at some time, to seek subsistence by preparing the roots for food. It is a singular fact, that the plant is called arrow-root by the islanders, perhaps from its sagittate leaves; and not the *Morantia annuina* which have derived its English name from the precious and known kind of arrow-root of the Isle of Portland and which I did not see. Some specimens of the Portland arrow-root, and some fresh roots of the *Arum* cultivated by Mr. Rogers, were laid on the table. The President thought that it was much more probable, that the name arrow-root was applied to the vegetable obtained from the *Morantia annuina*, as he had seen the circumstance of the pulp of this being having been formerly applied by the natives of the West-India Islands, to wounds inflicted by poisoned arrows.

Mr. Penney read an interesting paper on 'The place which Botany should occupy in the Studies of the Pharmaceutist.'

The President then said that, as this was the last meeting of the session, he could not but congratulate the members upon the great success which had hitherto attended them. He hoped that, during

therefore, those members who visited the country would remember that one of the leading objects of the Phytological Club was the formation of a herbarium of British plants, and that they would accordingly do all in their power, not only to collect plants themselves to present to the Club, but to urge their friends to do the same; by which means, he trusted, when they met again in October, he should be able to announce a long list of donations. Mr. Bentley also took this opportunity of again urging on the members the great importance of paying particular attention to the effects of climate on the medicinal activity of plants. Observations on this subject were much wanted, and he hoped that some of the country members would furnish a paper on this subject, as they alone were in a position to investigate it with any probable success.

It was strange to those unacquainted with the Portlanders that, until within a few years, the Portlanders had kept themselves so entirely aloof from the rest of the world, even forsaking their friends who lived on the coast, and of the island, and not becoming a stranger to settle amongst them. We can no longer now wonder that they have kept their friends from the mainland of entirely distinct origin from the island of the mainland. Even now they had been so long in the island, that they had become a part of the island.

DUBLIN NATURAL-HISTORY SOCIETY.

June 10, 1883. J. R. Kinahan, Esq., in the chair.

Classification, &c. of Ferns.

Mr. Kinahan read a paper on the Classification and Nomenclature of Ferns. He had intended to read a paper on a subject which is very probably the most important of the day, but he was prevented by some other engagements. When, at the commencement of the session, he submitted to the Society several undescribed varieties of native ferns, he stated that, before the close of the session, it was his intention to offer some remarks on the subject of varieties of ferns. This promise he now proposes fulfilling. The rough outline of the system (if I may venture to use such a term) which I am about to bring before your notice, I have already laid before a kindred Society in this city; but, as I have since had opportunities of establishing what I then was only surmise, and of fully working out what was then but a rough outline, I hope the present paper may be deemed sufficiently original to be worthy of a place in your Proceedings. In every work on the subject of British ferns, we find species described under two heads, viz. the ordinary form, and what authors term varieties, under this term including every departure from the original type, whether it be or be not permanent under cultivation, or affecting the whole plant, — a mere monstrosity, or a doubtful species. This system gives rise to great inconveniences, as the student is often unable to tell whether the plant so described as a variety is (in relation to the original form) to be considered as a form modified by climate, &c. or as a mere deviation from the normal type arising from

some accidental circumstance of soil, situation, &c. &c. A second inconvenience, under the present system, with which students have to contend, arises from the want of ability of nomenclators; authors having described these forms, and given the same species, under different names; totally irrespective of those used by others who have preceded them. A third inconvenience arises from authors having described the same character of variety, when found in different species, by different names, thereby hardening the student's memory with a host of terms. These evils, modern botanists have, in great part, arisen from this subject not having been studied, it being the fashion with many to consider all monstrosities, gyno-phallous forms, maritima, &c. the same, and as such, unworthy the attention of the scientific student; and yet, morphologically considered, they are most interesting, not to say important, in often tending to throw light on obscure points in the anatomy of species. Furthermore, when such men as Linnæus, Willdoughby, and Ray, deemed them not below their notice, surely they are not beneath our view. To obviate these inconveniences, I propose the following plan for the descriptions of forms of ferns. I divide and add the following four heads: 1. *Forma*, or original type. 2. *Subforma*, or forms aberrant from some geographical influence, such as climate, &c. and including what are called doubtful species. 3. *Subvarieties*, or non-permanent monstrosities. 4. *Varieties*, or permanent monstrosities. Between these last, we shall find some very strange analogies, the similarity often appearing as though it were but a link between the variety and original form. I say appearing, because they never, at least as far as I can find, degenerate into one another; when any change does take place, the subvariety returning to the original type; and the variety, either degenerating into some other variety, or else also returning to the original form. To mark the last inconvenience, I would suggest, that each subvariety, variety, and subform, in whatever name many species found, but one distinctive name be given; defining that name as species and genera are at present defined; so that when we find this form under any species, we need but to the specific and generic names append this distinctive name, in order to render the identification of it easy, and thereby save ourselves the trouble of repeating with every species a probably long description. 5. *Subforms* would include all forms of the fern departing in a slight degree from the original type; so as to present a slight difference; and yet approaching it sufficiently nearly to be identified with the species generally prevailing through the entire plants of a district; often returning to the natural form under cultivation, and

bearing spores which produce plants similar to the original type. This class will include what are at present called doubtful species. 2. Varieties would include monstrosities, i.e. aberrant forms, or plants in which the original form of the species is lost, entirely or in part, so as to render identification difficult; found generally in isolated plants, generally permanent under cultivation, uniform in line, affecting all fronds of the plant; if fruitful, generally producing plants similar to the parent. 3. Subvarieties, i.e. aberrant forms, not permanent under cultivation, always retaining in a good degree the original type, not uniform, not necessarily affecting the same plant every year, even in a state of nature, and from its spores producing the normal form. In accordance with these views I have succeeded in classifying, under the following four heads, all the monstrosities described by authors, as well as many hitherto undescribed. These classes, and their distinguishing characters, I now hasten to lay before you, in the following order, using the terms variety and subvariety in the sense stated just now, of which I shall describe each analogous variety and subvariety together, but I shall believe there is any necessary connection between them, for the reasons stated before, but merely for convenience of discussion. For the first subvariety, I propose to give the name multifidum, taking as its type the common hart's tongue, var. *multifidum*; and including under it those forms, in other species, to which the names bifidum, lobatum, ageratum, &c. have been given. With these I propose to join, as the analogous variety, the ferns, as *polypodioides*, taking as its type the common hart's tongue, var. *repens*, and incorporating under it those varieties to which the names crispum, bipinnatum, multifidum, furcatum, &c. have been given by various authors. The definitions of these two will be as follows:—*Repens* variety:—Rachis divided and subdivided, segments rounded at their edges, and apices generally curved and crisp, and often terminating in a sharp bifurcation; segments confluent at their edges. Near this must be placed, if not incorporated with it, the two following varieties:—*Furcata* var. *repens*, and *repens* of fronds split up into segments, segments not called; *Stratum* var. *repens*:—Apex of frond having the rachis split up into numerous segments, each terminating in a broadly curved expansion; pinnae much contracted, and stalked at their extremities. Multifidum subvariety:—Rachis divided and subdivided, segments proceeding the usual outlines of fronds, but irregular in outline, and at their edges and extremities, and often terminating in a point at the extremity of each segment. Both these ferns have the following modifications in colour:—Rachis either single, or divided so as to present

the appearance of two fronds on the one stalk; and, second, the ends of the pinnae divided, as well as the apex of the frond. These will include of described forms:—Common polypody, subvar. *multifidum* and *bifidum*, Newm. (Glenc and Dublin); male shield-fern, var. *farcaetum* (*multifida*), Moore (England); lady-fern, var. *ramosum* or *crispum*, Auct. (Ulster and Scotland); also (2), *fistulatum-nidipetrum*, Stebb.; *multifida*, Moore (Killarney, *Ogilby*; Wicklow, *Newm.*; Glenc; *misit*; Chatsworth, *J. Bain*), and (3), *nodosum*, whitigreen-stalked spleenwort, subvar. *ramosum*, Auct. (Ireland); hart's-tongue, var. *ramosum* or *crispum*, Auct., *dedalea*, Koch, subvar. *multifidum* or *lobatum*, Auct. (common in Ireland); northern hard fern, subvar. *multifidum*, described by Deakin (common in Ireland), var. *ramosum*, recently described before this Society, in February, 1868 (Lough Breagh county Wicklow); adder's-tongue, subvar. *ramosum*, Auct.; mosswort, subvar. *ramosum* of authors. The subvariety is found on a great many species which are unrecorded. I have, in addition to the above, met with, in this country, in the male Rottie, and Brice's ferns, *Polystichum angulare* and *P. aculeatum*, lady-fern, wall-rue, black-stalked, sea-side, and maiden-hair spleenworts, *Grammitis*, common brake, and Killarney bristle-fern. In some it is very common; in others, rare. I found it also in cultivated specimens of *Asplenium fontanum*, and in many foreign species. Next, the variety *strictum*, taking the common polypody, var. *Cambricum*, as the type, I propose to call *Cambricum*; it will include the varieties called *incisum*, *polystichoides*, and *strictum*. The allied subvariety, taking the analogous subvariety of the same fern, *sinuatum*, I propose to call *sinuatum*; it includes *sinuatum*, *prolifum*, &c. These two I define as follows:—*Cambricum* variety. Fronds either smaller, or larger, than original type; pinnae serrated, or irregularly lobed at their edges; basils rounded; segments rounded and confluent. This includes two groups distinct types, in one of which we find the parts of the original type in excess; in the other, we find them contracted. This last corresponds to *strictum*. *Sinuatum*: Pinnae serrated, and irregularly lobed; segments pointed and distinct; frond generally more luxuriant than normal. Under these heads are included the following described forms:—Polypody of oak, var. *Cambricum*, Ldb. (said to have been found in Wicklow and Wales), and the subvar. *lobatum*, *Newm.*, *serratum* and *pinuatum* of other authors (common in Ireland); maiden-hair spleenwort, var. *incisum*, Newm. (Yorkshire); hart's-tongue, var. *polystichoides*, Ray (England); northern lady-fern, var. *strictum*, Francis (England), and *Gleadowes* county Wicklow, and the

concluding, I will say a few words on the study of varieties. I know it has been urged as an argument against it, that it tends to increase spurious species; but this statement is an error, as the effect of it would be quite the other way; and as nothing can tend so much to do away with "spurious species" as a study of all the changes species undergo. In the kindred science of Zoology, when we are in doubt about points of identity, we seek them, often, not in the perfect animal, but in the monster. Why, then, should we not, in plants, apply the same rule, and seek amidst the vagaries of monstrosities for the rules which govern regular forms?—for these I can they often be deduced, as by the bread of of the law we oftentimes are reminded of his existence. To show that this theory, system, or whatever you will call it, is not unnatural, I have drawn out a table of eight species, in which we find these forms; now described, prevailing in the following ratio. The species are male fern, hart's-tongue, common polypody, northern hard fern, lady fern, maiden-hair spleenwort, angular shield fern, and prickly shield fern. Amongst these, *randallii* occurs in the first four; *multidum*, in the whole eight; *Cambricum*, in the first four and the sixth; *A. 2*, in five; *sinuatum*, in the same five; and the subform *abbreviatum*, in the first, second, third, fifth, seventh, and eighth, six in all. This concludes the subject. Whether my deductions are overdrawn, or not, you can judge for yourselves, as you have before you the greater part of the specimens from which, as the materials, they were drawn. Many of these, however, especially among the subforms, are now very inadequate pictures of what they were when growing, as it is impossible, even by the most careful drying, to preserve many points of importance in distinguishing between the forms. They are all, with very few exceptions, which I have marked, Irish specimens, gathered during the last two years, and therefore fair specimens of the forms to be found in a state of nature. Mr. Kinnahan, in conclusion, gave a tabular view of his proposed classification; detailing the reasons why he considered that the present nomenclature included specific characters that caused confusion.

ROYAL PHYSICAL SOCIETY OF EDINBURGH.

On Bothrodendron, Uledendron, Stigmaria, &c., and restoration of Sphenopteris elegans.

At a late meeting of this Society the following paper, intitled "On Bothrodendron, Uledendron, Stigmaria, and other characteristic plants

of the Carboniferous Period, (with a restoration of *Sphenopteris elegans*) by Hugh Miller, Esq., was read. The author began his paper by quoting from Mr. Bunbury's description of a fossil fern of the North American coal measures, published in the 'Journal of the Geological Society' for 1852. "It is rare," says Mr. B., "to find, in the ferns of the carboniferous period, even the stipes, or leaf-stalk, completely preserved down to its base; the only specimen of the kind that I have seen is a beautiful *Sphenopteris* (I believe *Sphenopteris elegans*) from the Edinburgh coal-field, in the collection of Mr. Hugh Miller." What is deemed rare by Mr. Bunbury, one of our highest authorities in fossil botany, must be regarded as absolutely so; and Mr. M., now prohibited, he said, and attempted to describe, this unique fossil, in the hope of adding a very little to what was already known regarding one of the most beautiful and characteristic ferns of the lower coal measures. From a snipe of specimen on the Society's table, it would be found that, even in one particular, the entire frond of *Sphenopteris elegans* could be restored, so as to be rendered as palpable to conception as the fronds of the green brake, which in one respect it resembled, that flourished last season on the sunny hill-sides, or amid the deep woodland glades of our country. In one important particular, however, the restoration must be incomplete. So far, as Mr. M. knew, no specimen of any coal-measure species of this ancient genus exhibits the fructification; and we must be content, therefore, to acquaint ourselves simply with the general outline and venation of the plant. All previous attempted restorations of *Sphenopteris* had been unfortunate. It seems to have been inferred, from the minuteness of the pinnules, that the frond to which they belonged had also been minute; and so in the restorations, such as that of the late Dr. Mantell, in his 'Wonders of Geology,' and that of the interesting oil painting of carboniferous plants in the Museum attached to the Edinburgh Botanic Garden, restorations introduced, however, rather for pictorial than scientific purposes, the large, eminently handsome, and apparently solitary frond given to the plant by Nature, has been represented by mere dwarfish pinnæ, rising gregariously, as in *Polypodium* and *Asplenium*, from a common rhizoma. In one important respect, *Sphenopteris elegans* resembled *Pteris aquilina*, our common hill-side bracken. It was furnished with a stout, leafless rachis, exceedingly similar in form to that of *Pteris*. Nay, it exhibited so completely, in Mr. M.'s specimen, the same club-like slightly bent termination, the same gradual diminution in thickness, and the same smooth surface, that one accustomed to see this

part of the bracken used as a thatch, and a very durable thatch the stipules of the bracken do form; can scarcely doubt that the stipules of *Sphenopteris* would have served the purpose equally well. Evidently, if it were not still in existence to be employed for that purpose, a wood thatched with *Sphenopteris*, with its pinnae and leaflets concealed, and only its club-like stems exposed, now above, now in the ordinary style of the fern thatchery could not be distinguished, so far as form and size went, from a roof thatched with *Statis*. As a height of from seven to eight inches above its club-like termination, the stem divided into two equal parts, which shot upwards with a divergence that rendered the fork between an angle of about 30°; and at unusual heights a little farther up, each of these divided stems (bifurcated) in turn, at about the same angle, and then shot up, in some individuals, with still further division; while in others they bifurcated again, and yet again. It is probable that, as in many of the recent ferns, the greater divisions of the plant were constant, while the smaller, varied according to the richness of the soil; and the consequent size and degree of development attained by the fronds. As in *Pteris squillina*, there, shoots out from these main stems numerous pinnae irregularly alternate, and which, becoming less compound as they approached the top of the plant, passed, in ascending, from bipinnate to bipinnate, and at last, finally, the form of simple alternately pinnate leaflets. Unlike *Pteris*, however, whose stem remains bare of pinnae until its larger divisions take place, the stem of *Sphenopteris* is elegant and forthright, on opposite sides two compound pinnae, the lower about an inch, the other about a trifle and a quarter or so, below the first fork, a peculiarity of structure that must have imparted a graceful fullness of outline to the lower portion of the frond, which, had the rachis been bare, it could not have possessed. Alternation, however, in the bifurcations of the main, secondary, and tertiary stems, and in the case of a lower, greater pinna, that seem to have been placed opposite, not nearly so constituted the law that regulated the form of the plant. The pinnae alternated on the greater stems; the semi-pinnae alternated on the pinnae, and finally, the minute, closely-nerved, spatulate leaflets alternated on the semi-pinnae. The entire frond must have been of great lightness and beauty of style, intermediate from the plumpness of its leaflets and the slenderness of its secondary and tertiary stems, between that of the frond of *Pteris squillina*, and that of the fully developed sucker of the graceful *Asparagus*. A hill-side clothed with these delicately fronded ferns must have rolled its mimic waves of soft green to every high breeze that stirred the depths of the old carboniferous

ferous forest, and the light and flexible covering which it gave to the undulating plain or gentle acclivity, must have contrasted not unpleasantly with the columnar trunks of stunted *Sigillaria* or scaly *Lepidodendron*, or with the huge rectilinear boles of gigantic *Araucarians*. After several remarks on the numerous so-called species of *Sphenopteris* found at Bardon House, most of which Mrs. M. regarded as but mere varieties of a single species, he went on to state that he had an opportunity of seeing, about six years before, though but for an instant, the larger portion of a fossil of *Neuropteris gigantea* after laid it open at a pit-mouth near Musselburgh, in a mass of gray shale, shortly split and weathered; but he could do little more than determine that, like *Sphenopteris elegans*, and the common bracken, it does not have a thick bare rachis, and that its pinnae, like its leaflets, were alternate in their arrangement; when it fell to pieces in his hands. Mrs. Miller regretted that, during the glimpse which he enjoyed of this beautiful fossil, she failed to remark the order in which the larger divisions of the rachis took place; she merely saw, from the general effect, that the frond as a whole, balanced on its strong club-shaped leaf-stem, was greatly massier than that of either *Pteris aquilina* or *Sphenopteris elegans*; and that in the clustered richness of its leaflets, although not in their disposition, it resembled our recent *Osmunda regalis* or royal fern. So transient was his glimpse of the plant, that it has since confirmed him of those momentary glances caught, according to tradition, of long-buried monarchs in their sepulchres, that in one moment are seen August in all their robes, and in the next descending before the admitted air into a shower of light dust. Mrs. Miller next exhibited and described a very fine, and in some respects, unique specimen of *Ulodendron* stems, which he had disinterred from out a bed of ferruginous shale, in the Water of Leith, a little above the village of Colinton. Though little more than 10 inches in length by 3 in breadth, it exhibited no fewer than seven of those round beaming fully sculptured stems, ranged serially along the trunk or stem, by which this ancient genus is so remarkably characterized. The specimens is covered with small, sharply relieved, obovate scales, most of them furnished with an apparent midrib, and with their edges slightly turned up, and from these peculiarities, and their great beauty, are said to remind the architect of that style of sculpture adopted by Palladio from his master, Vitruvius, when, in ornamenting the Corinthian or Composite torus, he fretted it into closely imbricated obovate leaves. These scales are ranged in elegant curves, which one of the members of the Royal Physical Society, Mr. Charles Peach, as his

quick eye caught the arrangement in Mr. M.'s specimen, compared not inaptly to those ornamental curves, a feat of the turning-lathe, which one sees roughening the backs of ladies' watches. On Mr. Miller's specimen exhibited, as it lay in the rock, what, so far as he knew, no other specimen of *Ulodendron* had yet shown, a true branch shooting out at an acute angle from the stem, and fretted with scales of a peculiar form, varying from irregularly rhomboidal to irregularly polygonal. It has been shown by Messrs. Lindley and Hutton, on the evidence of one of their specimens, figured in the 'Fossil Flora,' that the line of circulations or seal scars, so remarkable in this genus, and which are held to be the impressions made by a rectilinear range of cones, an almost sessile now existed in duplicate, occurring on two of the sides of the plant directly opposite. Its cones were thus ranged all in one plane. The branch struck off from one of the intermedial sides, but what in the transverse section would be at right angles with the cones, and though little can be founded on a single specimen, such certainly is the disposition of branch that seems best to consort with such a disposition of cone. It may be added, said Mr. M., that if all the branches were also ranged in one plane like the cones, such a disposition would not be quite without example in the vegetable kingdom, even as it now exists. "Our host," says the late Captain Basil Hall, in his brief description of the Island of Java, "carried us to see a singular tree, called familiarly the 'traveller's friend,'—*Urania* being, I believe, its botanist name. We found it to differ from most other trees, in having all its branches in one plane, like the sticks of a fan on the feathers of a peacock's tail." Influenced, perhaps, by Captain Hall's description, and the figure of *Urania* given in his work, Mr. M. had been accustomed, he said, to think of *Ulodendron*, though his evidence on the subject was still far from ample, as a plant somewhat resembling in its contour the old Jewish candlestick, as sculptured on the arch of Titus. Mr. M. then went on to show that *Ulodendron* was not, as surmised by the authors of the 'Fossil Flora,' a mere form of *Lepidodendron*; though not improbably another of their genera *Bothrodendron*, was a mere form of it. At least, *Ulodendron*, when degenerated, exactly resembles the latter plant, being mottled over with minute dottings quincuncially arranged, and presenting its reticulate line of oval spots devoid of the ordinary sculpturings. After several remarks on *Lepidostrobus variabilis*, which, as shown by specimens on the table, could not be the same of *Ulodendron*, as Messrs. Lindley and Hutton had surmised, but was unequivocally, he had been informed by Adolphe Brongniart, that of *Lepidodendron*, Mr. M.

went on to describe what he deemed a new species of *Stigmaria*, which he had found in Joppa quarry. In the specimen exhibited, the characteristic areoles of the plant presented the ordinary aspect. Each, however, formed the centre of a sculptured star, consisting of from eight to twenty rays, or rather the centre of a sculptured flower of the composite order, resembling a garden daisy, the minute petals being ranged in three concentric lines. Mr. M. then referred to the discovery by Mr. Binney of Manchester, that the *Stigmarias* are the roots of *Sigillaria*, or rather said Mr. M., the discovery that they occupy the place of roots. From a specimen on the table, it would be seen that they terminated very differently from true roots, ending as abruptly as any of the Cactus tribe, and with their bud-like areoles thickly clustered at the extremities. After arguing the point at considerable length, Mr. M. went on to say that it might be thought he consistently held, that while the place and position of *Stigmaria* were, as shown by Mr. Binney, those of true roots, just as the place and position of the rhizoma of *Pteris aquilina*, or of *Cryptogramma crispum*, are those of true roots, it was, notwithstanding, not a true root, but merely a congeries of subterranean stems, that sent forth from the centre at which they converged, a thick subaerial trunk, richly sculptured, and covered with a foliage of which every trace has long since disappeared. There was but one other plant of the coal measures, said Mr. M., to which he would at present call the attention of the Society. It was evidently a fern, but presented at first sight more the appearance of a Cycadaceous frond than any other vegetable organism of the carboniferous age yet seen. From a mid-stem, about a line in thickness, there proceed at right angles, and in alternate order, a series of sessile lanceolate leaflets, rather more than two inches in length, by about an eighth of an inch in breadth, and about three lines apart. Each is furnished with a slender midrib, and what seems a singular, though not entirely unique feature in a fern, the edges of each are densely hirsute, and bristle with thick, short hair. The venation is not distinctly preserved. In conclusion, Mr. M. took the liberty, he said, of urging on such of the members of the Society as possessed unique fossils of our carboniferous Flora, — unique either from the circumstance of their being positively new, or of throwing new light on the forms or structure of plants already known in part, — the importance of exhibiting and describing them for the general benefit. The authors of both Fossil Flora and Fossil Fauna, however able or accomplished they may be, have often to found their genera and species, and to frame their restorations, when they attempt

these, on very inadequate specimens. For, were they to pause in their labours until better ones turned up, they would find the longest life greatly too short for the completion of even a small portion of their task. Much of their work must of necessity be of a provisional character; so much so, that there are few possessors of good collections who do not find themselves in circumstances to furnish both addenda and errata to our most valuable works on Palæontology. And it is only by the free communication of these addenda and errata that geologists will at length be enabled adequately to conceive of the by-past creations,—of, in especial, the Faunas of the palæozoic and secondary periods, and of that gorgeous Flora of the carboniferous age, with some of whose organisms Mr. M. had been attempting to deal, and which seems to have been by far the most luxuriant and wonderful which our emphatically ancient earth ever saw.

NOTICES OF NEW BOOKS, &c.

'The Annals and Magazine of Natural History,' No. 66, June, 1853.

This number contains the following botanical papers:—

'Remarks upon British Plants; by Charles C. Babington, M.A., F.R.S., F.L.S., &c.'

'On the Genera of the Tribe Duboisæ; by John Miers, Esq., F.R.S., F.L.S.'

'Observations on Relative Position; including a new Arrangement of Phanerogamous Plants; by B. Clarke, F.L.S., &c.'

'Researches on the Fecundation and Formation of the Embryo in Hepaticæ and Ferns; by H. Philibert. Extracted from the *'Comptes Rendus,'* Dec. 13, 1852, p. 851.

Mr. Babington's paper is continued from the previous number, and exhibits the same care and research as before. The genera treated of are *Myosotis* and *Thymus*; and the observations on these are so fully reported in the last number (*Phytol.* iv. 984), that an abstract would be almost tautological.

The *Seaside Collector's Guide* containing *Public Instructions for Collecting and Preserving, and a List of all the known Species and Localities in Great Britain*. By J. Cocks, M.D., Devonport. London: John Van Nostrand, 15, Paternoster Row. 1893.

It is recorded of some modern Zeiluses that he quaintly characterized a book he was reviewing as containing "many things both new and true;" but, then, as a kind of set-off to this modicum of faint praise, he goes on to say that "the new things are not true, neither are the true things new." Now we would by no means be understood to insinuate that the new things in Dr. Cocks's 'Guide' are not true, neither would we quarrel with his true things because they are not new: his little book is indeed confessedly a compilation from standard works of acknowledged high character, and the name of Dr. Harvey is a sufficient guarantee for the intrinsic value of the ample extracts from that gentleman's published works on the British Algæ, which we meet with in many parts of the 'Guide.' These quotations are, we believe, in all cases accompanied by an acknowledgment. Such an acknowledgment, indeed, is no more than the due of an author whose labours are appropriated by followers in the same field of research as himself: it is, to say the least of it, a graceful compliment to those who have cleared the way for their successors, and should in no case be withheld; although, as it appears to us, our author has not in every instance stated the source whence his materials have been derived.

Dr. Cocks gives some plain and useful directions for collecting and preserving the marine Algæ, which will greatly assist the young algologist in the preparation of his specimens. Very few of the directions for drying the Algæ can however be classed among the new things of the book; at all events, they bear a very striking family likeness to similar instructions given by Dr. Drummond, in a valuable paper published in the 'Magazine of Zoology and Botany' for 1838 (ii. 144). This likeness is, indeed, so strong, that we can hardly persuade ourselves that they belong to that class of undesigned coincidences which every now and then occur in the writings of independent labourers on kindred subjects. A few of these parallel passages we quote below, premising that we have *Italicised* such phrases as are the more striking from their close similarity, we might say, their identity.

Cocks, 1853.

"The first step to be taken is to examine each one separately, and carefully remove *every particle* of extraneous matter that may be attached. These *foreign bodies*," &c.—P. 17.

"Notwithstanding the pains we may have taken to clean our specimens beforehand, we shall often find, when they are fairly spread out, that there are still some minute particles adhering to them." —P. 17.

"These are effectually removed with a pair of dissecting forceps, which are, * * indeed, almost indispensable in laying out marine Algæ. They will, besides, be found most useful for various purposes difficult to describe."—P. 17.

"Now, the quality of the paper is a matter of considerable importance, * * for it frequently happens that a great error is committed in this respect, not only by the novice, but also by the more experienced algologist, in using paper of a thin and inferior quality, which very much injures the appearance of the specimen." —P. 18.

"There are some species in particular, that contract so much in drying, as to pucker the edges of the paper if it is not sufficiently thick, and these are then seen to considerable disadvantage."—P. 18.

Drummond, 1838.

"The first object to be attended to in preserving marine plants is to have them washed perfectly clean before spreading. There should not be left upon them a particle of sand or other foreign body."

"Whatever pains we may have taken to clean the recent specimens, we shall often find, when spreading them, that some foreign particles continue attached."

"And for the removal of these a pair of dissecting forceps, and a camel's hair pencil of middle size, will be found very convenient. These, indeed, are almost indispensable, and will be found useful on more occasions than can here be specified."

"The next thing to be attended to is the quality of the paper on which the specimens are to be spread; and here a great error is generally committed, in using it thin and inferior, by which, if the specimen be worth preserving, it has not proper justice done to it."

"Some species, too, contract so much in drying, as to pucker the edges of the paper if it be not sufficiently thick, * * * and this has a very unsightly appearance."

" This observance serves, also, to give a neatness and uniformity to a collection, not to be accomplished by using papers cut at random, or of casual dimensions."
—P. 19.

" We have thus three regular sizes of paper, and this serves to give a uniformity and neatness to a collection, not to be obtained by using papers at random, and of casual dimensions."

These extracts speak for themselves, and require but little comment. Dr. Drummond's paper has been laid under contribution, or it has not. If Dr. Cocks has availed himself of the instructions for drying the Algæ therein contained, he should have said so: if not, this division of his book offers as curious a case of identity of ideas and phrases, as did the famous speech of a certain ex-Chancellor which made so much noise a short time ago.

'The Annals and Magazine of Natural History,' Nos. 67 and 68, July and August, 1853.

No. 67 contains the following botanical papers:—

'Remarks on some Algæ belonging to the Genus *Caulerpa*; by R. K. Greville, LL.D., &c.'

'Description of a New Species of *Rhododendron* from Bootan, in India; by Thomas Nuttall, Esq.'

'Observations on Relative Position; including a New Arrangement of Phanerogamous Plants:—Part IV. On Dorsal Placentation; by B. Clarke, F.L.S., &c.'

'On the Structure of the Leaves of Palms; by M. A. Trécul.

Miscellaneous:—'On the Fecundation of the *Fucaceæ*,' by M. Gustave Thuret (from the '*Comptes Rendus*'); 'Experimental Researches on Vegetation,' by Georges Ville.

M. Thuret states that when the dioecious *Fucaceæ* are kept in a damp atmosphere, "the spores and antheridia are pushed out on the surface of the fronds in great numbers." If kept in separate vessels, the antheridia "emit their antherozoids, which move about with the greatest vivacity;" these movements, which are frequently continued till the next day, gradually diminish in intensity, and on the third day decomposition commences. "The spores remain for about a week without sensible alteration; they then also decompose without further development. Sometimes phenomena resembling germination are exhibited; some of them emit irregular prolongations, but no septa

are formed ;" their evolution, however, proceeds no further, and they decompose like the antherozoids. When the spores and antherozoids are mixed together, germination soon commences, and proceeds rapidly. "If the experiment has been performed on a slip of glass kept constantly near a window, in the same position," nearly all the radicles turn away from the light, and towards the interior of the room. When the antherozoids are in considerable quantity, they are seen to "attach themselves to the spores, crawl in a manner upon their surface, and communicate to them, by means of their vibratile cilia, a rotatory movement which is often very rapid. Nothing is more curious than the appearance of these large brownish spheres [the spores] rolling in all directions among the crowd of antherozoids which surround them." The author failed in his endeavours to fecundate the spores of *Ozothallia vulgaris* (*Fucus nodosus*, *Linn.*) with the antherozoids of *Fucus serratus* and *F. vesiculosus*, and *vice versa* ; nor was he more successful when he applied the antherozoids of *Fucus vesiculosus* to the spores of *F. serratus* ; but on reversing the latter experiment, he found that some of the spores of *F. vesiculosus* germinated. He does not however venture to conclude from this that hybrid fecundation is possible, but mentions it to call attention to the fact, that whilst "the *Ozothallia* and *Fucus serratus* are very constant in form, *F. vesiculosus* is extremely polymorphous."

No. 68 contains no botanical paper.

Contributions towards the Geographical History of the Plants of Upper Teesdale. By JOHN G. BAKER, Esq.

DURING a recent visit to Teesdale, I have procured numerous notes respecting its botanical productions, and their localities ; but these have been so frequently examined, and recorded in detail, that, with some few exceptions, it will only be desirable to reproduce here those portions of my observations which relate to the geographical area embraced by the rarer species, or extend the limits previously ascertained in this country for those of more general occurrence.*

* The estimates of altitude, in leaps of fifty yards, are based upon the barometric measurements of Professor Phillips, as reported in his new work, 'The Rivers, Mountains, and Seacoast of Yorkshire.' The temperature is calculated according to the rule of Dalton, as in the 'Cybele Britannica ;' assuming the isotherm of 48 degrees for that of the coast-level, and deducting one degree of mean annual temperature for

Thalictrum flexuosum, Reich. Ascends to an elevation of 300 yards (average annual temperature, 45 degrees), along the banks of the Tees, below Holwick, Yorkshire.

Barbarea vulgaris. Ascends to 200 yards (46 deg.), on the banks of the Balder, near its junction with the Tees, Yorkshire.

Erysimum Alliaria. Ascends to 200 yards (46 deg.), on hedgebanks by the roadside near Cotherstone, Yorkshire.

Arenaria serpyllifolia. Ascends to 400 yards (44 deg.), in a cultivated field near Langdon Bridge, Durham.

Hypericum quadrangulum. Ascends to 350 yards (45 deg.), on the roadside near the High-Force Inn, Durham.

Hypericum hirsutum. Ascends to 350 yards (45 deg.), in the wood behind the High-Force Inn, Durham.

Geranium lucidum. Ascends to 400 yards (44 deg.), along the banks of Langdon Beck, near the bridge of the Alston road, Durham.

Prunus spinosa. Ascends to 350 yards (45 deg.), amongst the scars above Holwick, Yorkshire.

Geum urbanum. Ascends to 350 yards (45 deg.), in the High-Force Wood, Durham, with *Poa Parnellii* and *Crepis succisæfolia*.

Agrimonia Eupatoria. Ascends to 250 yards, on the roadside above Romalakirk, Yorkshire.

Potentilla fruticosa. Descends below 150 yards (nearly 47 deg.), at Greta Bridge, Yorkshire, *Baines' Flora*; ascends to 400 yards (44 deg.), on the Durham side of the Tees, near its junction with Langdon Beck.

Sanguisorba officinalis. Ascends to 450 yards (44 deg.), on the lower portion of Falcon Clints, Durham.

Epilobium parviflorum. Ascends to 400 yards (44 deg.), in a streamlet near Langdon Bridge, Durham. Much less hairy than the ordinary lowland state.

Circæa lutetiana. Ascends to 200 yards (46 deg.), on a wall near the junction of the Balder with the Tees, above Cotherstone, Yorkshire.

each hundred yards in elevation. To avoid unnecessary repetition, the climatic zone is only mentioned where the species has not been ascertained to occur in the same zone before. As a general rule, the line of 45° (900 feet) may be considered as the boundary between the midagrarian and superagrarian zones in this latitude; and that of 42° (1800 feet) as the upward limit of cultivation. In a few cases, where I have personally collected the species in the specified locality, the authority for its occurrence is given.

Berberis vulgaris. Ascends to 350 yards, in the High-Force Wood, Durham, but possibly introduced.

Saxifraga Hirculus. Ascends to upwards of 600 yards (42 deg.), along the margin of Netherheath Syke, near the Earl of Thanet's shooting-box, Westmoreland, *J. Backhouse, jun.* (Phytol. i. 892). Inferarctic zone.

Peucedanum Ostruthium. In several localities on both sides of the Tees. Though affecting a preference for the vicinity of farm-houses, it may safely be referred to the same category of citizenship as *Myrrhis odorata*. Ascends to 400 yards (44 deg.), near the junction of Harewood and Langdon Becks, at the foot of Widdy Bank, Durham. Superagrarian zone.

Torilis Anthriscus. Ascends to 250 yards (46 deg.), on walls at Mickleton, Yorkshire.

Chærophyllum temulentum. Ascends to 250 yards (46 deg.), along the roadside near Mickleton, Yorkshire.

Sambucus nigra. Ascends to 300 yards (45 deg.), amongst the tumbled rocks and débris below Holwick Scars, with *Allosurus crispus* and *Polypodium Dryopteris*; doubtless a native locality.

Galium cruciatum. Ascends to 300 yards (45 deg.), along the banks of a small stream below Holwick, Yorkshire, with *Melampyrum sylvaticum* and *Equisetum umbrosum*.

Scabiosa Columbaria. Ascends above 400 yards (44 deg.), on the eastern extremity of Falcon Clints, Durham, with *Potentilla alpestris*.

Knautia arvensis. Ascends to 300 yards (45 deg.), on the Yorkshire bank of the Tees, near Lower Cronkley Bridge.

Leontodon hispidum. Ascends to 400 yards (44 deg.), at the foot of Widdy Bank, Durham, with *Carex Persoonii*. Superagrarian zone.

Crepis succisæfolia. Descends to 150 yards (46 deg.), in hedges and meadows between Barnard Castle and Lartington, Yorkshire. Midagrarian zone.

Hieracium pilosum, "*β. subnudum, Fröl., Fr.*; *H. tricocephalum, Willd.?* *H. Lawsoni, Auct. Ang.* in part. Rocks on the Durham side of the Tees, at Wince Bridge; below the High Force; and at Falcon Clints. Range of elevation, 300—450 yards (45—44 deg.) Sparingly at each station.

Hieracium cerinthoides, L. With great difficulty, I procured a couple of specimens from the inaccessible rocks at the White Force, Cronkley Fell, Yorkshire, at an elevation of 450 or 500 yards.

Hieracium iricum, Fr. On both banks of the Tees, and in the bed

of the stream below Wince Bridge, in considerable plenty ; more sparingly higher up the river. Range of elevation, 300—400 yards.

Hieracium pallescens scapigerum, Fr. On the rocks of Falcon Clints, Durham, at an elevation of 400—500 yards. Formerly supposed to be *H. plumbeum*, *Fries* (Phytol. iv. 453).

Hieracium Saxifragum vimineum, Fr. With *H. pilosum*, at the eastern extremity of Falcon Clints, Durham, very sparingly, at an elevation of upwards of 400 yards.

Hieracium murorum, L. ; *H. nudicaule*, *Edmondst.* Rocks on the Durham side of the Tees, below the High Force.

Hieracium cæsium, Fr. On the Yorkshire side of the Tees, below Cotherstone, and near Wince Bridge ; on the Durham bank, near the High Force ; and other localities.

Hieracium vulgatum, Fr. Frequent throughout Teesdale. Var. *medium*, Fr. On rocks in High-Force Wood, Durham.

Hieracium gothicum, Fr. On both sides of the Tees, about Wince Bridge ; and on the Durham side, above the High Force and Langdon Bridge. Range of elevation, 300—400 yards. Var. *humillimum*, Fr., is the most frequent form. Differs considerably from the plant of "Hook & Ockham," Surrey and Kent, distributed under this name last season, through the Botanical Society of London (Phytol. iv. 934).

Hieracium tridentatum, Fr. Ascends to 350 yards (45 deg.), in the High-Force Wood, Durham.

Hieracium crocatum, Fr. The ordinary form of this species, with the vars. *dilatatum* and *angustatum*, Fr., grow plentifully on both sides of the Tees, about the bridges of Wince and Lower Cronkley ; and more sparingly at the High Force.

Hieracium corymbosum, Fr. On the Yorkshire side of the Tees, below Holwick ; about Wince Bridge ; and on the Durham bank, at the High Force and above Langdon Bridge. Range of elevation, 300—400 yards.

Hieracium boreale, Fr. Ascends to 400 yards (44 deg.), with the former, above the bridge of the Alston road, over Langdon Beck.

Serratula tinctoria. Ascends to 300 yards (45 deg.), on the banks of the Tees, at Wince Bridge. Superagrarian zone.

Carlina vulgaris. Ascends to 350 yards (45 deg.), on Force-Garth Scars, Durham.

Centaurea nigra, var. *radiata*. On the Yorkshire bank of the Tees, at Wince Bridge.

Pyrethrum Parthenium. Ascends to 200 yards (46 deg.), on a

wall near the junction of the Balder with the Tees, in company with *Hieracium cæsium* and *Circæa lutetiana*.

Polemonium cæruleum. Ascends to upwards of 600 yards, in a limestone hollow near the station for *Saxifraga Hirculus*, on the banks of Netherheath Syke, Westmoreland, with *Asplenium viride*, *J. Backhouse, jun.* (Phytol. i. 892).

Mentha aquatica. Ascends to 400 yards (44 deg.), in a streamlet near Langdon Bridge, Durham.

Origanum vulgare. Ascends to 350 yards (45 deg.), in the wood behind the High-Force Inn, Durham.

Stachys Betonica. Ascends to 350 yards (45 deg.), in High-Force Wood, Durham. Superagrarian zone.

Primula farinosa. Ascends to 600 yards (42 deg.), on the summit of Widdy-bank Fell (Black Moor), Durham; and probably higher on the Yorkshire side of the Tees.

Plantago media. Ascends to upwards of 400 yards, on the eastern portion of Falcon Clints, Durham.

Chenopodium Bonus-Henricus. Ascends to 400 yards (44 deg.), near Langdon Bridge, Durham.

Polygonum Bistorta. Ascends to 300 yards (45 deg.), on the Yorkshire bank of the Tees, at Wince Bridge, with *P. viviparum*.

Rumex sanguineus. Ascends to 200 yards (46 deg.), on the road-side near Cotherstone, Yorkshire.

Salix pentandra. Ascends to 450 yards (44 deg.), on the margin of the Whey Sike, Widdy Bank, Durham.

Salix bicolor. In the forms *Croweana*, *Weigeliana*, and *nitens*, frequent throughout the superagrarian zone, in Teesdale and Wear-dale.

Allium ursinum. Ascends to 300 yards (45 deg.), along the road-side near Unthank, Yorkshire.

Juncus glaucus. Ascends to 200 yards (46 deg.), along the road-side near Cotherstone, Yorkshire.

Blysmus compressus. Ascends to 500 yards (43 deg.), along the margin of the Whey Sike, Widdy Bank, Durham, in company with the next species.

Elyna caricina. Descends to 500 yards (43 deg.), along the margin of the Whey Sike, with *Bartsia alpina*.

Carex Persoonii, Sieb. Descends to 400 yards (44 deg.), near the junction of Whey Sike with the Harewood Beck, Durham.

Avena flavescens. Ascends to 400 yards (44 deg.), in meadows near Langdon Bridge, Durham.

Festuca pratensis. Ascends to 400 yards (44 deg.), in meadows near Langdon Bridge.

Brachypodium pinnatum. The High-Force Wood, in which this species is reported as growing (Phytol. i. 114), is not, from its geological character and elevated position, a very likely locality to produce it. Possibly the next species, which is conspicuous there, may have been mistaken for it.

Triticum caninum. Ascends to 350 yards (45 deg.), in High-Force Wood, Durham.

Lastrea glandulosa, Newm. In company with the ordinary form of *dilatata* (multiflora, Newm.), amongst the débris below Holwick Scars, Yorkshire.

Equisetum variegatum. Ascends, with *E. palustre*, var. *alpinum*, Hook., to 500 yards (43 deg.), on Widdy Bank, Durham.

JOHN G. BAKER.

Thirsk, North Yorkshire,
August 6, 1853.

Notes of a Botanical Excursion down the Wye.

By T. W. GISSING, Esq.

PROBABLY the following notice of a few plants found during an excursion, in the early part of June last, down the Wye, may not be uninteresting.

I will first observe, that at Stroud, Gloucestershire, *Juniperus communis* and *Atropa Belladonna* were growing very abundantly; and that, in passing through Gloucester; I saw several plants of *Diplo-taxis tenuifolia*, on an old wall near the cathedral; I afterwards found this plant again, very sparingly, on an old wall about a mile from Clifton. *Cynoglossum officinale* is very common by the roadside all the way from Gloucester to Ross; in fact, it was very common in all the parts of Herefordshire that I visited. At a village called Pencraig, a short distance from Ross, one starved specimen of *Hyoscyamus niger* was growing; and near Goodrich Court, that overlooks the truly serpentine Wye, several tufts of the beautiful *Saxifraga hypnoides* peered from amidst the grass, in full flower. The river-banks yielded *Armoracia rusticana*. *Thlaspi arvense* flourishes in great profusion in fields about the old ivy-covered ruins of Goodrich Castle. On the Caldwell rocks, part of that wooded ridge crowned by the far-famed Symond's Yat, I observed a few poor fronds of

Polypodium calcareum. As I was "moving on," I had not that opportunity of observing the neighbourhood so closely as I should otherwise have desired. Amongst the grass at the foot of Rhaglan Castle was one plant of *Listera Nidus-avis*; two or three more of these peculiar, withered-looking plants were afterwards seen by the roadside between Monmouth and Tintern. On and near the noble ruins of Rhaglan, ferns are plentiful. Its walls produce *Asplenium Trichomanes*, *A. Ruta-muraria*, *A. Adiantum-nigrum*, *Ceterach officinarum*, *Polypodium vulgare*, and its var. *Cambricum*, in which latter the lobes are frequently bipinnatifid, and *Scolopendrium vulgare*; whilst at their base grew *Asplenium Filix-fœmina*, *Hook.*, *Aspidium Filix-mas*, *A. aculeatum*, and *Pteris aquilina*. Besides these, the woman resident in the castle informed me that a gentleman, lately there, told her that "a rare fern" grew in the keep. I looked very diligently, but failed to discover any other besides the above. I forgot to mention that an old man at Goodrich Castle stated to me, that the adder's-tongue grew plentifully in a wood near; and that ointment made with it was still in use amongst the poor people in that vicinity. It is frequently asked for at chemists' shops in Worcestershire, and is made by the inhabitants in some parts.

From Monmouth I proceeded to Tintern, where, I believe, a botanist might profitably spend a month or two. My stay was short; but amongst the plants I saw were the following:—*Ophioglossum vulgatum* (sparingly in a meadow about a mile from the abbey), *Anthyllis Vulneraria* (on a chalky bank near the base of the Wyndcliff, but I could see it in no other place), *Listera ovata*, *Habenaria chlorantha*, *Lysimachia nemorum*, *Blechnum boreale*, *Cardamine impatiens*, and *Melica nutans* (abundant in most of the woods). *Aspidium dilatatum*, *Rubus Idæus*, *Hypericum Androsæmum*, and *H. pulchrum* occur sparingly in several places. In a wood, locally known as Blackcliff Wood (I presume, from the dingy appearance of the crags that overlook it, and around which the piercing cry of the kite may be frequently heard by day, and the deep hooting of the owl by night), *Convallaria majalis* and *Allium ursinum* grow in such profusion, that, in walking through them, the combined odour of garlic and lily is by no means agreeable. Were it not that, as in most cases, the sweetness predominates over the disagreeable, the pedestrian who had once ventured would, a second time, be more careful in adhering to the beaten path, and thus leave the *perfume* of the garlic to slumber in its cells. So excessively plentiful are the lilies of the valley, that children may be daily met wending their ways to Chepstow, to dispose

of their fragrant bundles to the inhabitants of that town. Likewise, at the gate of the venerable abbey, women, as well as children, may generally be seen, whilst the lilies are in flower, retailing them to such visitors as wish to bear away a Tintern bouquet. In different places in the same wood, amongst *Convallaria majalis*, may be gathered chance plants of *Polygonatum officinale*; but there is great danger of its being eradicated, as it is generally sought to add beauty to the bunches of lilies. *Rubia peregrina* I found in several places in this wood, and *Aquilegia vulgaris* is scattered plentifully through all the woods in the neighbourhood. *Veronica montana* is very common in every wood, and by roadsides. *Vaccinium Myrtillus* and *Berberis vulgaris* are likewise to be found. *Epilobium angustifolium* and *Habenaria viridis* I saw in one spot only. *Euphorbia stricta* still flourishes in its original habitat, and *Geranium sanguineum* covers a rugged rock by the roadside, half a mile on the Tintern side of St. Arvans. A short distance from Tintern Abbey, towards Tintern Parva, I was fortunate enough to discover *Eryngium campestre*, by the roadside, near a manure-heap; two roots only were growing. I believe it has never before been observed in that locality. The Wye, on both sides, from Tintern to Chepstow, is fringed with the white flowers of *Cochlearia officinalis*; and the castle walls, at the latter place, are red with the blossoms of *Centranthus ruber*.

At Chepstow I left the Wye, and crossed the water to Clifton. On St. Vincent's Rocks, I gathered *Ophrys muscifera*, *O. arachnites*, *O. apifera*, *Hippocrepis comosa*, *Chlora perfoliata*, *Arabis stricta* (one specimen only), and *Helianthemum polifolium*. The last-named plant, I believe, has never been seen in this situation before; Brean Downs (Somersetshire), and Torquay and Babbicombe (Devonshire), being the only recorded habitats for it. On the Clifton Downs, at the top of St. Vincent's Rocks, grew *Rubia peregrina*, *Spiræa Filipendula*, and *Geranium rotundifolium*; and, about a mile from the Downs, I found one plant of the *Meconopsis Cambrica*. I looked carefully in every direction, but could find no more.

Numbers of other plants were, of course, growing on all sides; but the above I noticed, as the more uncommon ones.

T. W. GISSING.

44, High Street, Worcester,
August 4, 1853.

Notice of Equisetum fluviatile, Fries, in Britain; and an Inquiry into its Distinctness as a Species. By JOHN G. BAKER, Esq.

DURING the earlier part of the current season, an *Equisetum*, somewhat intermediate in habit between *limosum* and *palustre*, attracted my attention, in a growing state, in this neighbourhood; which, I supposed, might be the plant described by Fries as the *Equisetum fluviatile* of Linneus, and introduced to the notice of British botanists, in the second edition of Babington's 'Manual,' as having some slight claim to be considered a native of this country. Not possessing the means of arriving at a satisfactory decision upon this point, I forwarded a series of specimens of the Yorkshire plant to Mr. C. C. Babington, who, by comparing them with the examples and descriptions published in illustration of *E. limosum* and *E. fluviatile*, by Fries, in the 'Herbarium Normale Suecicæ,'* established its identity with the *E. fluviatile* of Scandinavian botanists, which he has also received from other localities in England and Scotland.

So far as they have come under my observation, the two supposed species, as they appear in this country, may be thus described:—

Equisetum fluviatile, Fries.

Rhizome creeping extensively, closely sheathed, darker coloured than the stem, with numerous bundles of slender, black, fibrous roots issuing from its nodes, and from those of the lower part of the stem.

Stem 3-4 feet high, 2-3 lines thick at its broadest part, fragile, *usually more or less branched, rarely simple*, erect or somewhat procumbent below, or curved above, round or slightly compressed, with 14-18 parallel striæ, divided transversely by numerous closely sheathed articulations, purplish brown and smooth towards its roots, below the sheaths, especially when submerged, light-

Equisetum limosum, Fries.

Rhizome creeping extensively, closely sheathed, darker coloured than the stem, with numerous bundles of slender, black, fibrous roots issuing from its nodes, and from those of the lower part of the stem.

Stem 2½-3½ feet high, 2-3½ lines thick at its broadest part, fragile, *usually simple frequently more or less branched*, erect or somewhat procumbent below, round or slightly compressed, with 14-18 parallel striæ, divided transversely by numerous closely sheathed articulations, purplish brown towards its roots, below the sheaths, especially when submerged, light-green above, when growing *quite green*,

* Herb. Norm. Suec. fasc. xi. Nos. 97, 98.

Equisetum fluviatile, Fries.

and, when growing, somewhat *scabrous* above.

Barren stem with 30-45 joints, and a *long, lax, slender, branchless, blunt termination*; fertile stem with 20-30 joints, *frequently overtopped by the uppermost whorl of branches*.

Primary sheaths (vaginæ) darker in colour than the stem, more faintly but similarly striated, with rigid, acuminate, purplish black teeth, equalling the striæ in number.

Branches multangular, ribbed like the stem, *long and slender, tapering upwards*, almost invariably *longer than the internodes*, usually twice their length, occasionally few in number and irregularly disposed, but more frequently *numerous* and arranged in *lax whorls, spreading at an angle of about 45°* with the stem, *ultimately somewhat pendulous*.

Secondary sheaths (vaginulæ) lax, the upper uniform in colour with the branches, but with their acute teeth tipped with purplish black, the lowest with subobtuse teeth, *coloured throughout*.

Spike *more or less stalked, slender, resembling that of E. palustre in size and shape, at first roundish, afterwards ovate-lanceolate, without an apiculus.**

Equisetum limosum, Fries.

smooth throughout.

Barren stem with 30-40 joints, and a *comparatively rigid termination, narrowing gradually upwards*; fertile stem with 20-30 joints, *never surmounted by its branches*.

Primary sheaths (vaginæ) darker in colour than the stem, more faintly but similarly striated, with rigid, acuminate, purplish black teeth, equalling the striæ in number.

Branches multangular, ribbed like the stem, *short and rigid, nearly equal throughout*, usually *nearly equalling the internodes in length* when matured, arranged in *regular erecto-patent ("arrect") whorls*.

Secondary sheaths (vaginulæ) lax, the teeth of the upper acute, of the lowest subobtuse, *all nearly uniform in colour with the branches*, but faintly tipped with purplish black.

Spike *nearly sessile, thick, gibbous, black, ovate, blunt*.

* For convenience of comparison, I subjoin the notes of Fries, accompanying his illustrative specimens in Herb. Norm. l. c., kindly furnished to me by Mr. Babington :—

The two species are almost precisely alike in their localities and mode of growth. The branched rhizomes, with their matted fibrous roots, creep extensively amongst the mud at the bottom of pools, canals, and slow streams : from these, in the spring, arise a miniature forest of stems, expanding and fructifying as the summer advances, and dying down in the autumn. In habit, *E. fluviatile* is more slender and elongated ; *E. limosum*, stouter and more rigid in texture. *E. fluviatile*, both in a barren and fertile state, is usually furnished with numerous long, slender branches, which, in the fully developed and characteristic form, are arranged in lax, irregular whorls, spreading from the stem at a considerable angle ; naked stems being nearly as unfrequent as in *E. palustre*. *E. limosum* is frequently, or usually entirely, without branches ; when present, they are not nearly so numerous as in the other species, and seldom much exceed the internodes in length : the whorls are consequently less dense, but are more regular, and the branches which compose them only curve slightly at the base, and run upwards almost parallel with the stem. Below the whorls, in *E. fluviatile*, are frequently placed solitary, elongated, lateral branches, which attain a considerable length, and have the internodes conspicuously developed. In the compound form of *E. limosum*, solitary branches are less frequent, and, when present, they are short and blunt compared with those of *E. fluviatile*, and the sheaths approximate closely. The barren stem of *E. fluviatile* is terminated by a long, slender, cord-like extension, entirely without branches, which withers and decays whilst the remainder is still green and vigorous. In *E. limosum* the termination is stronger, and narrows more gradually : when branches are present, they extend upwards higher than in the other species. It was once thought that the differences between grooveless acute, and sulcate blunt ribs, which are conspicuous when the plants are in a dried state, might furnish a distinctive character ; but each species varies considerably in this respect. The sheaths at the base of the branches, in both, are similar in shape ; but, whilst in *E. limosum* they do not usually differ much in colour from the stem, except at the point of their teeth, in *E. fluviatile* they are invariably coloured

“ *Equisetum fluviatile*, L. ! Caules toti striati raro nudi, semper heterocladi ramis numerosissimis, laxis, cauda sterili longa laxa fragile terminati. Spica tenuis æstivalis.”

“ *E. limosum*, L. ! Apud nos in prius vix transit : caules ex magna parte in vivo lævissimi ! simplissimi vel homocladi, ramis polygonis arrectis, apice æquales et conformes. Spica crassa atra vernalis.”

throughout. The spike of *E. limosum* is thick, black, and spongy, as is well represented in Newman's figure,* and is usually sessile, the uppermost sheath clasping it like an involucre. It expands earlier in the season than that of *E. fluviatile*, which is smaller in size, more slender and graceful, lighter in colour, and usually elevated from its sheath upon a fragile stalk. In order to afford a more precise idea of the habit and dimensions of *E. fluviatile* than can be conveyed in a general description, I have selected, for purpose of illustration, from a bundle of specimens collected in this neighbourhood, four average stems, which may convey some idea of its leading and most frequent states of variation.

A is a barren stem, measuring fifty inches in length, and, at its broadest portion, when pressed flat, three lines in breadth. It is curved considerably towards the summit, and tapers gradually, the thirtieth internode being exactly half the width of the twelfth. It has forty-one joints, the spaces between which, in its three lowermost quarters, vary in length from one inch to one and a half. All the nodes from the first to the fifteenth inclusive are branchless; the sixteenth has one branch, seven inches in length, with twelve joints; the seventeenth, one; the eighteenth and nineteenth, two each; the twentieth, one; the twenty-first, none; the twenty-second, two; but the remainder are branchless: in all, nine branches, of which the shortest is four inches in length.

B is a barren stem, forty-one inches in length, rather more slender than in the last. It has thirty-six nodes above those from which the roots issue. From the thirteenth of these issues a branch, five inches and a half in length; the fourteenth is branchless; the fifteenth has three branches; the sixteenth, six; the seventeenth, ten; the eighteenth, nine; the nineteenth, two; the remainder are branchless: total, thirty-one branches.

C is a barren stem, fifty inches in length, equalling the first in breadth. It has forty nodes above those from which the roots issue. Of these, the first to the thirteenth inclusive are branchless; the fourteenth has a single slender branch; the fifteenth, one; the sixteenth, eleven; the seventeenth and eighteenth, fourteen each; the nineteenth, twelve; the twentieth, thirteen; the twenty-first, seventeen; the twenty-second, fourteen; the twenty-third, eight; the twenty-fourth, four; the remainder are branchless: total number of branches, one hundred and nine, averaging two inches and a half in length.

* Hist. Brit. Ferns, 2nd ed. p. 51.

D is a fertile stem, measuring thirty-seven inches in length, and, at its broadest portion, when pressed flat, about four lines in breadth. It has twenty-five nodes, the first to eleventh of which inclusive are branchless; the twelfth has two branches; the thirteenth, three; the fourteenth, eight; the fifteenth, sixteenth, and seventeenth, each fourteen; the eighteenth, eleven; the nineteenth, twelve; the twentieth, fifteen; the twenty-first, thirteen; the twenty-second, sixteen; the twenty-third and twenty-fourth, ten each; the twenty-fifth, none: total number of branches, one hundred and forty-two, of which those of the uppermost whorl reach to the base of the spike.

The localities of *E. fluviatile*, so far as they are known to me, are as below. Probably it will be found to be not unfrequent throughout Britain, when it becomes better known, though less general than *E. limosum*:—

Scotland:—Dumbarton? Inverarnar, at the head of Loch Lomond, *C. C. Babington*. England:—(Lake) Lancashire: Silverdale (a polystachion state)! *H. Seeböhm*. Yorkshire: Ponds near Thirsk and Topcliffe, abundant!! and near Castle-Howard! *H. Ibbotson*. Cambridgeshire: Ely, *C. C. Babington*.

Now that the *Equisetum fluviatile* of Fries, no longer vaguely “reported as a native” upon uncertain authority, or “ambiguous otherwise,” is clearly ascertained to be an inhabitant of Britain, it becomes desirable to reopen the questions previously brought under discussion in the ‘*Phytologist*’;* and to inquire, in the first instance, whether it is distinct, as a species, from the plant of general occurrence throughout Britain, issued by Fries in his *Fasciculi* as *E. limosum*; figured by Smith, in ‘*English Botany*,’† under the same name; and by Newman, in his ‘*History of British Ferns*,’‡ under that of *E. fluviatile*: and, secondly, what is the correct nomenclature of each of the supposed species. To the first question, it is impossible to give a decisive answer; and it is a matter respecting which much difference of opinion may, and probably will, exist. So far as I am aware, in Scandinavia alone have the distinctions between them been clearly pointed out; and consequently the botanists of that country have enjoyed the best advantages for forming a decision respecting them. As has been already explained in the ‘*Phytologist*,’§ we are informed by Fries, in the ‘*Summa Vegetabilium*,’ that although nearly

* *Phytol.* iii. 1, 77, 85. † *E. Bot.* t. 929. ‡ *Hist. Brit. Ferns*, 2nd ed. p. 51.

§ *Phytol.* iii. 3, in an article by Mr. H. C. Watson, defending the correctness of the position of *E. fluviatile* in the second edition of the ‘*London Catalogue*.’

allied, they may be readily distinguished from each other ; and that at the present day they are considered as distinct species, by general consent, in Sweden, although formerly united.* On the other hand, there appears to be a want of positive characters, from which a good specific diagnosis might be framed ; the differences between them being principally in degree, which is probably the cause of *E. fluviatile* having been overlooked in Britain so long. For this reason, specimens somewhat intermediate may occasionally be noticed ;—luxuriant states of the barren stems of *E. limosum*, in which the whorls of branches have become more divaricated than usual, and spring from slightly coloured sheaths, much resembling diminished forms of *E. fluviatile*, when seen singly in a dried state. But, so far as I can judge, when they are fully examined in their native localities, or a sufficient series of characteristic specimens studied when dried, there need not be any difficulty in distinguishing one from the other. But whether the distinctions are sufficiently decisive and permanent in character to separate them as species, must be left for time and more extended observation to determine.†

With regard to the Linnean nomenclature, three alternatives present themselves for our consideration :—

1. That Linneus applied the names “*limosum*” and “*fluviatile*” to the plants described under the *same* names by Fries.

2. That he was unacquainted with *E. fluviatile*, *Fr.*, and applied the two names to the branched and unbranched forms of *E. limosum*, *Fr.*

3. That he was acquainted with both of the supposed species, but united them together ; in the ‘*Systema Vegetabilium*’ applying the name “*limosum*” to the almost branchless form, the “*Equisetum nudum lævius nostras*” of Ray ; and that of “*fluviatile*” to the more compound variety ; but afterwards, finding they were not specifically distinct, omitted the former from the ‘*Flora Lapponica*.’

Of these propositions, the first is decidedly incorrect ; because the

* “*E. limosum* et *E. fluviatile* utique nimis affinia sunt, sed apud nos (circa Upsaliam vulgaris) facile discernuntur et a nullo Botanicorum Suecorum, ad prisca contrahenda quam nova distinguenda promptiorum, conjuncta.”—*Sum. Veg. Scand.* p. 251.

† My large supply of specimens of *E. fluviatile*, and of the variety of *E. limosum* with furrowed ribs, will principally be distributed through the medium of the London Botanical Society. I would respectfully recommend this point to the notice of those who may receive them.

specimens preserved in the Linnean herbarium, labelled "fluviatile," in the handwriting of Linneus, belong to *E. limosum*, *Fr.*

There is a tolerably strong presumption against the correctness of the second alternative, as we are informed that both species are common in the neighbourhood of Upsal; and this is converted almost to a certainty, by the marks of admiration placed after "*E. fluviatile*, *L.*," and "*E. limosum*, *L.*," by Fries, in the Herbarium Normale; which imply that he has seen authenticated specimens, and that they belong to the plants which he describes.

So that the balance of probability appears to favour the view, that each of the names of Linneus and Fries is applied to a series of forms in some degree identical; but that the *E. fluviatile* of the 'Systema Vegetabilium' also includes a common form, or condition, of *E. limosum*, *Fr.* If this view of the case be correct, it will reconcile the apparent discrepancy between the statement of Fries (that he has seen authenticated specimens of *E. fluviatile*, *L.*, and that it is identical with *his* *E. fluviatile*) and that of Newman (that *he* has seen authenticated specimens of *E. fluviatile*, *L.*, and that it is identical with *E. limosum*); or, as it may be more concisely expressed:—

<i>E. limosum</i> , <i>L.</i> , Fl. Lapp.	= <i>E. limosum</i> , <i>Fr.</i> + <i>E. fluviatile</i> , <i>Fr.</i>
<i>E. fluviatile</i> , <i>Fr.</i>	= <i>E. fluviatile</i> , <i>L.</i> Syst. Veg. in part, non Linn. herb. vel Newman.
<i>E. limosum</i> , <i>Fr.</i>	= <i>E. fluviatile</i> , <i>Linn. herb.</i> + <i>E. limosum</i> , <i>L.</i> Syst. Veg. <i>E. limosum</i> , <i>Auct. Brit.</i> <i>E. fluviatile</i> , <i>Newm.</i>

JOHN G. BAKER.

Thirsk, North Yorkshire,
August 3, 1853.

Medical Properties of British Ferns.

By WILLIAM LAUDER LINDSAY, M.D., &c., &c.

I TAKE the liberty of writing to you on the subject of the use of British ferns in medicine, in consequence of your queries thereanent, contained in the letter lately sent by you to the Phytological Club of the Pharmaceutical Society, and which appeared in a late number of the 'Phytologist' (iv. 976).

Lastrea Filix-mas. This has been repeatedly used, of late, in different wards of this hospital, as an anthelmintic, in the treatment of

tape-worm (*Tenia solium*). It has also been extensively applied to the same purpose by the profession in Edinburgh, and other parts of Scotland. It had fallen into disuse greatly in this neighbourhood, in consequence of supposed inefficiency, but undeservedly so, until Prof. Christison, in two papers published in the 'Edinburgh Monthly Medical Journal,' for June 1852, and July, 1853 ('On the Treatment of Tape-worm by the Male Shield Fern'), showed that the want of success, in some cases, depended on bad preparations of the root, or old roots, being used. He found it almost uniformly successful in the form of an oleo-resinous extract, obtained by percolation of the root with ether. It is recommended in the dose of eighteen to twenty-four grains, followed by a purgative. In many parts of England, nothing is more common as a vermifuge than half a drachm to a drachm of the powder of the root, made up in the form of electuary, with a little treacle or jelly; in other parts of the country, the oil of the male fern is an equally common nostrum. But in neither of the latter conditions can its action be relied upon, especially if purchased in the shops of druggists, who generally not only sell old roots and bad preparations, but some the roots of totally different species. It is most apt to be, and has most frequently been, confounded with *Athyrium Filix-fœmina*, the root of which it has yet to be proved has a similar virtue. If time permit, in the course of this summer, I intend making a series of experiments, to determine whether the same anthelmintic, or what, properties reside in the roots of other of our common ferns. This fern was first used at Genève, by Peschier, some twenty or thirty years ago, in the form of an ethereal extract; but it appears to have been recommended as a vermifuge by Theophrastus, Dioscorides, and Galen; and it formed the chief part of Madame Nouffer's celebrated remedy for the tape-worm. It does not appear to be accurately determined on what special ingredients of the root its vermifuge property depends: we know it contains tannic and gallic acids. There is some contrariety of opinion as to the proper period of the year for collecting the plant for use; Peschier regarding it as most effectual if gathered between May and September, and Prof. Christison considering the date of collection immaterial. The only caution necessary in using it is, probably, that it ought always to be had *fresh*; if gathered and prepared by the practitioner himself, so much the better. The oleo-resin, however, seems to retain its properties for a considerable time; though what this period accurately is, still remains *sub judice*. It has been found quite efficient after being kept a year (Prof. Christison, *loc. cit.*) Prof. Christison commends it as a less disagreeable

and more efficient anthelmintic than the "Abyssinian Koussou, the Continental Pomegranate, or the American Turpentine. It is surprising that Peschier's observations, made on a very large scale indeed, have attracted so little attention in Britain." Dr. Küchenmeister recently made a number of experiments on the relative value of vermifuges in common use, by immersing living worms in albumen, at a temperature above 77° Fahr., and adding the anthelmintic. He found *Tænia crassicolis*, thus treated with the etherial extract of the male fern, died in two hours and three quarters,—a longer period, however, than in the case of Koussou (*Brayera anthelmintica*, an Abyssinian rosaceous shrub).* Pereira gives an excellent article on this fern (in his 'Materia Medica,' vol. ii. part 1.), which may be referred to for particulars as to the chemistry of the root. *Vide*, also, Christison's 'Dispensatory,' Royle's 'Materia Medica,' Graves' 'Hortus Medicus,' and other works on medical Botany or pharmacopœias.

With regard to other ferns and their allies, these, like most indigenous plants, appear at one time, and that not long gone by, to have held a high place, either in professional or domestic medicine; and notes of their applications in this respect are to be found in a great number of local Floras, and in works on medical Botany, medical journals, &c. *Vide*, for instance, Burnett's 'Outlines of Botany,' Pereira's 'Materia Medica,' Lightfoot's 'Flora Scotica,' and Smith's 'English Flora.' They appear, however, to be little, if at all, used at the present day. I shall briefly glance at the alleged properties of a few.

* *Adiantum Capillus-Veneris*. Ray, in his 'Historia,' attributes every possible virtue to it, on the authority of a Montpellier physician. Its frond is still sold in some shops, for the purpose of making the agreeable beverage called "capillaire," which, however, usually contains *no* *Adiantum*, but is made of "clarified syrup, flavoured with orange-flower water." It is slightly astringent, and was recommended in pulmonary complaints. Like most ferns, it contains tannic and gallic acids; but its properties are, in all probability, *imaginary*.

Aspidium. Various species have been supposed possessed of certain properties, and were formerly officinal in some of the English provinces, and included in some of the Continental pharmacopœias (Burnett).

* *Vide* 'Association Medical Journal,' July 8, 1853, and February 11, 1853; 'Dublin Quarterly Journal of Medical Science,' February, 1853; Froriep's 'Tagsberichte über die Fortschritte der Natur-und Halkunde. Pharmakologie.' Band i. p. 317.

Asplenium Trichomanes was formerly used as an expectorant by the peasantry of Scotland, but is rarely found in shops (Lightfoot).

Asplenium Ruta-muraria, Lightfoot says, was once sold as an expectorant and deobstruent; and the same authority states that

Asplenium Adiantum-nigrum was sold as a pectoral.

Botrychium Lunaria. Its virtues are probably imaginary only, and due to its supposed resemblance to the moon. Ray stated, on Needham's authority, that an ointment made of it, rubbed on the loins, in dysentery, is very effectual in stopping the attack (Smith). It was also used as a vulnerary (Lightfoot).

Ceterach officinarum was the "Chetherak" of Persian physicians. Greatly commended in jaundice, and splenic diseases (Burnett and Lightfoot).

Equisetum arvense is said to be astringent and diuretic, and various species have been praised as diuretics (Burnett and Lightfoot).

Lycopodium clavatum is emetic in decoction. Its sporules were formerly greatly used by druggists, for covering pills; and physicians were also in the habit of using them, for dusting over excoriated surfaces in children, and in erysipelas, eczema, and similar diseases. They are essentially absorbent and desiccant, and have been said also to be diuretic (Pereira and Smith).

Lycopodium Selago. Its infusion is powerfully emetic and cathartic; hence its use as a cathartic, emmenagogue, and abortifacient. In large doses, it is a narcotico-acrid poison, causing giddiness, convulsions, and death. It is used by the Scotch Highlanders as a counter-irritant and detergent (Pereira, Smith, and Lightfoot).

Osmunda regalis. Its root is astringent, and hence styptic and tonic, and is vaguely supposed to be "strengthening and healing." It was formerly used in rickets; now probably quite abandoned (Burnett and Smith).

Ophioglossum vulgatum was recommended as a vulnerary, in the form of ointment, applied to fresh wounds, by Mathiolus, Tragus, &c. (Lightfoot).

Polypodium vulgare is the "rheum-purging Polypody" of Shakespeare. The powdered root was formerly used, externally, as an absorbent, and for covering pills. In domestic medicine, this plant was also used as an expectorant. The ancients attributed to it cathartic properties.

Pteris aquilina is very astringent, containing a considerable amount of tannic and gallic acids; hence it has been greatly used as an anthelmintic. Lightfoot states that the Scotch peasantry use it, in powder,

as a vermifuge (1777); and "look upon a bed of the green plant as a sovereign cure for the rickets in children." The ancients used a decoction of the root as a diet-drink.

Scolopendrium vulgare is also astringent; hence it has been used, in the form of ointment, as a vulnerary (Lightfoot and Smith).

To enter more minutely into your queries:—

1. I have shown that, at least, *one* species is used in medicine, at the present day, to a very considerable extent; and it is very probable that other ferns, having similar astringent properties, are employed as vulgar nostrums in many of the more remote parts of our Island.

2. The *species* used (above referred to) is undoubtedly the *Lastrea Filix-mas*; though it is very probable that, in shops, the roots of other ferns, and especially *Athyrium Filix-fœmina*, are substituted for it; thus partially accounting for the great variety observed in its action in the hands of different practitioners. The ferns which most resemble this *Lastrea* in chemical constituents, and are therefore most likely to possess similar therapeutic powers, are *Pteris aquilina*, and various species of *Lastrea*, *Polypodium*, and *Asplenium*. But this I hope soon to make the subject of experiment.

3. I have shown that many species are useful, and might become more so, on account of the large quantity of tannic and gallic acids they contain; hence their astringency and anthelmintic powers. From their also containing considerable amounts of starch, sugars, and gums, fixed and volatile oils, and bitter extracts, I am satisfied that a large proportion of our indigenous ferns might be made available in therapeutics, as tonics, styptics, astringents, vermifuges, and demulcents. The virtues attributed to some species, however, are purely imaginary, and directly traceable to "ancient predilections;" *e. g.*, *Botrychium Lunaria* and *Adiantum Capillus-Veneris*.

4. It is exceedingly difficult to determine this point; but it is probable the use of the *Lastrea*, as an anthelmintic, will increase. There appears to be a tendency at the present day to give a due amount of credit to indigenous plants for their curative powers, as depending on ascertained chemical properties. It has too long been the habit of pharmacutists and medical men, of this and other countries, greedily to accept everything *foreign*, that is lauded for its supposed virtues, and add it to their *Materia Medica*; entirely overlooking the more humble and more despised, in consequence of being more easily attainable, denizens of our woods, fields, and moors, which, nevertheless, probably possess equally useful properties. In this respect,

it seems to me that the so-called "ignobile vulgus" show an example to "the profession:" they find the buckbeans, tormentils, and gentians, which grow in all their moors, equally serviceable, as astringents and tonics, with the Catechus, Kinos, and Quassias of distant lands. It is to be hoped that now, however, medical men, no less than botanists, will see floral treasures in every roadside of our own country.

WM. L. LINDSAY.

Royal Infirmary, Edinburgh,
July 29, 1853.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-eighth Sitting.—Saturday, August 27, 1853.—MR. NEWMAN, President, in the chair.

The President read the following communication :—

Monstrosity of Medicago maculata.

"Mr. Sprague, Fellow of St. John's College, has placed in my hands a monstrosity of *Medicago maculata*, gathered by him, on August 8, near Cambridge. It consists in a change of the usual cochleated and spinous pod of that plant into one of a falcate shape, and quite unarmed. These pods are about three quarters of an inch long, linear, but narrowing gradually at the end into a subulate beak. They are laterally compressed, have many ovules, and are curved backwards so as to form a segment of a circle of greater or less extent.

"As some proof is requisite that a plant producing such very different pods is really a state of *M. maculata*, it is a fortunate circumstance that, in one instance, a single pod of the proper shape and structure belonging to that species is attached to the specimen. It seems to have been one of the first pods produced by the plant, as it is nearly, or quite, ripe, and placed near to the bottom of the stem."
—Charles C. Babington ; August 10, 1853.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, July 14, 1853.—Professor Balfour, President, in the chair.

Donations to the Society's herbarium were announced, from the Oregon Botanical Association (valuable specimens of plants, recently received from Mr. Jeffrey, their collector), and from Mr. Alex. O. Black (a parcel of British plants).

The President announced that a new part of the Society's 'Transactions' was expected to be ready for distribution in the course of a few days.

Dr. Balfour exhibited a number of donations recently made to the Museum of Economic Botany, at the Botanic Garden.

Dr. Balfour mentioned the following localities for rare plants in the neighbourhood of Edinburgh:—*Hordeum maritimum*: Kincardine, in abundance (Mr. Robert Carr). *H. pratense*: Kincardine (Mr. John G. Cunningham). *Alopecurus agrestis*: abundant near North Berwick (Mr. J. Lockhart Morton). *Petasites fragrans*: in immense profusion in a wood near North Berwick. *Alyssum calycinum*: Arthur's Seat (Mr. G. R. Tate, and Mr. G. Lawson, jun.) *Mimulus luteus*: near Lanark (Mr. John Cleland). *Marrubium vulgare*: Gosford Links (Mr. Cropper). *Carex aquatilis*: near Lanark (Mr. W. O. Priestley). *Sedum dasyphyllum*: roadside near Queensferry (Miss Lambie). *Trientalis europæa*: near West Calder (Mr. Soubki). *Equisetum umbrosum*: near Garrion Bridge, on the Clyde (Mr. John Ross).

Mr. G. Lawson exhibited specimens of a collection of Fifeshire mosses, proposed to be published by Mr. C. Howie, who, in conjunction with Mr. A. O. Black, had carefully investigated the cryptogamic Botany of the East of Fife.

Dyeing Properties of Lichens.

A paper by Dr. W. Lauder Lindsay, intituled 'Experiments on the Dyeing Properties of the Lichens,' was read.

The author observed:—"It has appeared to me interesting to discover, by a series of simple chemical experiments, the possible applicability of a large number of native species of lichens to the art of dyeing and colouring; and for this purpose I have made, during the last two years, the experiments comprehended in the table now laid before the Botanical Society. Such an inquiry is, however, not only

scientifically interesting ; but it may come to be an important matter, in a pecuniary point of view, to discover, at home or abroad, some cheap and easily procurable substitutes for the *Roccellas*, which are rapidly becoming scarce, and consequently valuable, in European commerce. The results of my experiments are not so satisfactory as I could have wished, owing to the comparatively small number of fresh specimens operated on ; still, I think, they will sufficiently indicate that we have in Scotland a large number of species capable of yielding excellent colouring matters, in every probability capable of supplanting, or vieing with, the *Lecanoras*, *Gyrophoras*, *Umbilicarias*, &c. (which are at present largely collected in Norway and Sweden for the London market), or even with the *Roccellas*. It is not for me, at present, to say on what chemical changes the various re-actions I have laid down depend ; whether all, or how many, of these colours can ever become serviceable to the dyer, or otherwise, and, if so, by what processes. These and similar questions I leave it for the chemist, dye-manufacturer, and dyer to decide ; meanwhile, merely indicating facts.

“The greater number of the lichens operated on are herbarium specimens, collected, several years ago, in various parts of Switzerland, Scotland, and the Vosges district ; a few are natives of Norway, Germany, and other foreign countries.

“The re-agents used for the development of colour are only intended to be applied to those lichens which contain colourless principles, capable of conversion, by chemical metamorphoses, into coloured substances. They are chiefly adapted to the evolution of a red colour, which is the most important yielded by the lichen family. Where the thallus contains abundance of colouring matters ready formed, these are soluble in almost any fluid ; and ammonia or hypochlorite of lime have not a more specific action on them than water.

“In order to attain some degree of uniformity in the nomenclature of the colours obtained in these experiments, especially those produced by ammoniacal maceration, I have designated the more marked tints according to Werner’s celebrated nomenclature of colours, as contained in the little work edited by Syme.

“In the ‘Table of Experiments,’ the 1st column contains the botanical name, and, in many cases, the synonym, of the lichen operated on.

“The 2nd column contains generally the country of which the plant is a native, and more particularly the nature of its habitat.

“The 3rd column contains the date of collection of the plant. It

will be noticed, where several specimens of the same species, which have been collected at different dates, have been operated on, the results vary considerably.

"In the 4th column is given the colour, or character, of the alcoholic decoction of the lichen, which is usually previously comminuted, or pulverized, in order the more fully to expose it to the action of solvents and re-agents.

"The 5th column exhibits the colorific effects, on the alcoholic decoction of the plant (*i. e.*, the solution of its colorific principles), of a weak solution of bleaching liquid, sufficiently strong, however, to be pungent. This is merely a solution of the common bleaching lime, or chloride of lime, and may be considered essentially a solution of hypochlorite of lime, which is its active constituent.

"In the 6th column is shown the effect of weak aqua ammonia on the alcoholic decoction; a sufficiency being usually added to render distinctly ammoniacal the mixture, which is then allowed to stand for one or two days.

"The 8th column exhibits the colours obtained by macerating lichens in a weak ammoniacal solution (of sufficient strength, however, to be distinctly pungent), for periods varying from one month to two years.

"In the 7th column are comprehended a few miscellaneous remarks, chiefly, *first*, on the use of various native lichens in dyeing, by the peasantry of Britain and other countries; and, *secondly*, on the use of various exotic and native species in the manufacture of orchil, cudbear, and litmus."

Cryptogamic Plants of the Neighbourhood of St. Andrews.

A paper by Mr. Alexander O. Black, 'On the Cryptogamic Plants of the Neighbourhood of St. Andrews,' was read.

The author stated that a residence in St. Andrews, during the last eighteen months, had given him an opportunity of investigating the vegetation of a part of our island, hitherto but little explored by botanists. Having devoted much attention to the Cryptogamic orders in general, but more particularly to the ferns and mosses, he thought that the result of his researches might, perhaps, be useful in illustrating the local distribution of these plants.

But few of the hills rise to the elevation of even 500 feet, and these are not unfrequently entirely cultivated: for this reason we find Fife much less prolific in alpine plants, than several counties situated further South; while its northern position effectually excludes all, or

nearly all, lowland plants. The soil is more or less sandy throughout the whole East of Fife, and generally (especially to the North) very dry, there being but one marsh, the Peat-Inn Bog, in the Largo ward; that, however, is of considerable extent. A large sandy plain, about twelve miles in length, by about five in breadth at the widest part, stretches north of St. Andrews. This is divided into the Tents' Muirs and St. Andrews Links, by the river Eden. The former would prove, beyond a doubt, a very rich botanic station; it bears a great resemblance to the well-known Sands of Barry, in the adjacent county of Forfar; and on it, Mr. Black stated, he had already met with the majority of rarities found there; such as *Carex incurva*, *Juncus balticus*, *Cochlearia danica*, *Teesdalia nudicaulis*, *Cerastium tetrandrum*, *Sagina maritima*, *Radiola Millegrana*, *Gentiana Amarella*, *Veronica Anagallis*, *Blysmus rufus*, *Equisetum variegatum*, var. *arenarium*, *Weissia nigrita*, *Didymodon inclinatus*, &c; in addition to which, it produces several plants unknown on the Barry Links, and two not at present found in Forfarshire; viz., *Anagallis tenella*, *Linn.*, and *Lycopodium inundatum*, *Linn.*

The following plants were noticed, as having their petals changed from other colours to white:—*Cakile maritima*, *Viola canina*, *Erodium cicutarium*, *Astragalus hypoglottis*, *Scabiosa succisa*, *Carduus lanceolatus* and *C. palustris*, *Lychnis Flos-Cuculi*, *Campanula rotundifolia*, *Calluna vulgaris*, *Erica cinerea* and *E. Tetralix*, *Galeopsis Tetrahit*, *Thymus Chamædrys*, *Primula vulgaris*, *Gymnadenia conopsea*, and *Orchis mascula*.

Mr. Black then gave a list of the *Equiseta*, ferns, and *Lycopodia* found by him, which included *Equisetum umbrosum*, *Polypodium Dryopteris* and *P. Phegopteris*, *Allosorus crispus* and *A. fragilis*, vars. *cynapifolia* and *dentata*, *Polystichum aculeatum*, var. *lobatum*, *Lastrea Oreopteris*, *L. Filix-mas*, var. *incisa*, *L. dilatata*, var. *nana*, *L. spinulosa*, and *L. Fœnisecii*, *Athyrium Filix-fœmina*, vars. *incisum*, *trifidum*, and one approaching *latifolium*, *Blechnum spicant*, *Scolopendrium vulgare*, *Asplenium marinum*, *Botrychium Lunaria*, *Ophioglossum vulgatum*, *Lycopodium inundatum*, *L. alpinum*, *L. Selago*, and *L. selaginoides*. He had found, in all:—*Equiseta*, 11 species and varieties; *Filices*, 32; *Lycopodia*, 5; *Musci*, 170.

Mr. Black stated that it was his intention, had he remained in Fife, to have compiled a Flora of the county, which is, in the meantime, interrupted; but he hopes to renew his researches in Fifeshire, as well as in other parts of Scotland.

Hardiness of certain Coniferæ.

A paper by Mr. W. W. Evans, intituled 'Remarks on the Hardiness of certain Coniferæ, as shown by the effects of the past winter,' was read.

The author, after making some introductory observations, observed : —“ Among the junipers mentioned as ‘killed’ in Messrs. Lawsons’ nursery, are *Juniperus Bermudiana*, *J. flaccida*, *J. Mexicana*, and *J. Sophora* ; and on referring to page 261 of the ‘Gardener’s Chronicle,’ I find that *J. Bermudiana*, *J. Bedfordiana*, and *J. religiosa* are reported as ‘killed’ in Wiltshire. The only one of these tried in the Experimental Garden was *J. religiosa*, which was very much injured, especially on the side next the north-east, although partially protected with spruce branches. Again, in Mr. Robertson’s list, *Cupressus macrocarpa* and *C. funebris* are stated to be ‘healthy and fresh ;’ while *C. Goveniana* and *C. thurifera* are reported as ‘completely killed down to the roots.’ On the other hand, at Boynton, near Bridlington, on the east coast of Yorkshire, and at Nostell Priory, near Wakefield, *C. macrocarpa* is stated to be ‘very much injured by the frost ;’ while *C. funebris* ‘seems perfectly hardy,’ ‘not having been injured in situations where the others mentioned have been.” In the Horticultural Society’s Garden, a plant of *C. macrocarpa*, four feet high, remained perfectly green and uninjured ; but a smaller plant of *C. funebris*, nearly in the same situation, had to be removed in the spring, the whole of the north side being killed ; this plant was also slightly protected by branches. *C. Goveniana*, in the same locality, but unprotected, was killed to the ground, as was *C. Udheana*. *C. thurifera* was not tried. It appears that *C. Goveniana* was uninjured at Chiswick, although much hurt at Kew. It is stated to have been killed at Dublin, and totally uninjured in Cambridgeshire. It was completely killed in Messrs. Lawsons’ nursery, as before mentioned ; while in Messrs. Dickson & Son’s nursery, on the opposite side of the road, and within a few hundred yards, a fine plant escaped unhurt. From the foregoing examples, it appears to me that something more than a mere list of the ‘killed and wounded’ is required, before we can come to anything like a correct opinion as to the hardiness of newly introduced plants ; and that it is of the utmost importance that all such lists should be accompanied by meteorological observations, the distance from, and height above, the sea, exposure, size of plants reported on, and how long planted ; and observers, in all parts of the

country, should be invited to send in such reports to some central point, where they could be generalized, and the results made public."

Cones on Pinus Lambertiana.

A paper by A. G. Spiers, Esq., of Culcreuch, intituled 'Notice of the Production of Cones, in 1851, on *Pinus Lambertiana*,' was read.

The tree on which the cones were produced was stated to be about 23 feet in height. The cones contained perfect seeds, from which young plants have been raised.

Mr. M'Nab stated that several plants of *Abies Morinda* were fruiting this season, in different situations; viz., at Riccarton, Dysart House, and the Botanic Garden. He mentioned that all these plants had grown in the Botanic Garden, and had been transplanted last year. The large plants of the same pine, which had not been transplanted, showed no symptoms of flowering.

Measurement of Trees in Gurhwal and Kemaon.

A paper by Mr. John Strachey, C.S., intituled 'Measurement of Trees in Gurhwal and Kemaon, in 1852' (communicated by Major Madden), was read.

Major Madden stated that he had received this communication from Capt. Richard Strachey, with permission to make what use of it he thought best. He therefore laid it before the Botanical Society, thinking it might be interesting to have some actual measurements, by a careful observer, of Himalayan trees, some of which are now being so largely introduced into Britain.

Of one example of *Cedrus Deodara*, growing at an elevation of 8000 feet above the sea, the author says, it had "a perfectly sound, straight, single trunk. At 40 feet from the ground, I tried to measure its girth, but could not manage it; but I convinced myself that, at that height, it must be more than 20 feet round. This is a wonderful tree."

The author remarks of eleven examples of *Cupressus torulosa*, at elevations of from 7500 to 8000 feet, that they "are in a grove of several hundreds, all within a few hundred yards of each other, doubtfully indigenous; but cypress is common all about here. The whole of them are most magnificent. I measured many more than these. Trees of from 18 to 20 feet abound, and I therefore do not put them down. All these are quite sound; most of them single trunks to the top. No. 1 divides into two great trunks, from 20 to 30 feet from the ground, and is a wonderful tree; No. 2 divides into two great trunks, near the base; No. 3 is a single trunk. No. 1 is close

to the great Deodar. The height of these cypresses is most probably more than 200 feet."

Osseous Legumen of Hymenæa Courbaril.

A paper by Dr. Seller, intituled 'Notice of the Osseous Legumen of the Hymenæa Courbaril,' was read.

"The osseous indehiscent legumen of the Hymenæa Courbaril, now exhibited, attracted more notice from the first writers on Carpology than it obtains from those of recent date. As a mere cabinet curiosity, it became prized at no long period after the discovery of America. It is supposed to be referred to by Oviedo, the contemporary of Columbus, and the earliest author on the Natural History of the New World.

"In 1585, this legumen was sent, as a curiosity, to De l'Ecluse, then Director of the Botanic Garden at Vienna, by John Garetus, an apothecary of London. De l'Ecluse, or Clusius, the name by which his fame is perpetuated in the genus *Clusia*, and the natural family *Clusiaceæ*, has given, in his work on exotics, published after he became Professor of Botany at Leyden, a good figure of this legumen, and a distinct description of it, under the name of '*Lobus Wingandecaon*,' from the place whence it was supposed to have come. Clusius seems to think that this pod had been brought to London by some of the followers of Sir Walter Raleigh.

"John Bauhin, in his '*Historia Plantarum Universalis*,' refers to the description given by Clusius, saying, he had been presented with a specimen of this pod, by Frederic Duke of Wurtemberg, whose physician he was at that time. He also gives a good figure of the pod and seeds, along with the figure of a young plant, which, he says, the Duke had caused to be raised from the seed. The leaves of this young plant enable us to identify the pod, figured by Bauhin, with that of the *Hymenæa Courbaril*.

"In 1658, the '*Historia Naturalis Utriusque Indiæ*' was published, by Piso, or Pison, whose name is perpetuated in the genus *Piso*, of the family *Nyctagineæ*. Piso was a physician of Amsterdam, who accompanied Prince Maurice to the New World. Piso gives a description of the tree and the fruit, and figures the legumen, and a branch. The flowers he could not obtain, owing to the great height of the tree. He confirms the conjecture, long before entertained, that this pod belongs to the tree affording the gum anime, now called the *resina animes*. He calls the tree '*Jetaiba*,'—a name seemingly derived from what he gives as the Brazilian word for the gum anime, which is

‘*Jetica-eica*.’ Up to this time, no name for the tree appears to have been known in Europe. The name *Courbary*, or *Courbaril*, occurs first among French authors, as in *Du Tetre*, a French missionary’s history of the French West-India Islands, published in 1654, and in Rochefort’s history of these Islands, published in 1681.

“Ray, in his ‘*Historia Plantarum*,’ published in 1686, copies the description of *Piso*. Ray had got a specimen, without seeds, from Doody, who was Superintendent of the Gardens at Chelsea. Doody supposed it had come from Antigua. Ray tells us that the plant was reared in Bishop Compton’s garden, at Fulham, whose name is deservedly remembered by botanists in the *Comptonia asplenifolia*, of the order *Myricæ*. That Bishop Compton’s plant was really the *Hymenæa Courbaril*, appears from the figure of a branch given by Leonard Plukenet, in his ‘*Phytographia*,’ who says he got the branch from the Bishop’s plant. Plukenet’s ‘*Phytographia*’ was published in 1691. It contains, also, a good figure of the legumen, and of the seeds. He calls the tree ‘*Ceratia diphyllus Antigoana*.’ He says it is called the locust-tree in the West Indies, because the pod contains a sweet pulp, like the carob, or fruit of the locust-tree of Europe.

“In 1703, Plumier, the greatest botanist of the New World, according to Linneus, described the *Hymenæa Courbaril* with exactness, under the name ‘*Courbaril bifolia*.’

“The tree has since been described by many authors, and figured by a considerable number. Among these, are Browne, in his ‘*History of Jamaica*,’ and Jacquin, who, though his great work on American plants was published near the middle of last century, lived an honoured life nearly to our own times.

“The supposed medical virtues of the *resina animes* kept up attention to this legumen, not less than its own singular character as a pericarp, throughout the seventeenth and eighteenth centuries; and when I remark that it has met with less attention in later times, I merely refer to the omission of it in the ordinary descriptions of the legumen in modern works on Carpology, which omission is, at least, to the extent that one tries in vain, by consulting our common books, to discover what this fruit is.

“Gaertner, however, has given a very complete description of this pod and the seeds, of which I give a portion in English:—

“‘The legumen large, ligneous, thick, oblongo-reniform, becoming thicker towards the outer extremity, and obtuse, unilocular, valveless, filled with a dry pulp. The pulp exactly filling the cavity of the legumen, externally sprinkled with a red powder like brick-dust,

within white, fungous, resolvable into innumerable linear processes (philyras) resting very closely on each other, and, besides, divisible into as many separate portions as there are seeds, to which it adheres most closely, and which it entirely involves.

“The seeds are four to eight, elliptical, globular, very slightly (obsoletissimè) compressed, black, terminated by a solid, fungous, white umbilicus, directed towards the superior, or concave, suture of the legumen.

“The outer covering single, somewhat stony, very hard, carbonaceous within, distinguished by a somewhat prominent groove, immersed in the rima of the cotyledons, and marked within the substance of the groove with a calcareous, snowy nerve, to be traced to the umbilicus.

“Albumen none, and no trace of it.

“The embryo conformable to the seed, straight, yellowish. The cotyledons thick, plano-convex, separated throughout the whole circumference of their commissure by a depressed groove, and as it were gaping.

“No plumula.

“The radicle globular, retracted, centrifugal.’

“On this description, I propose to offer one or two observations.

“Gaertner does not mention the length of the pod. That before us is about 7 inches long, and 3 broad. This legumen is described, by many authors, as being from 4 to 7 inches long, and 2 to 3 inches broad. It appears seldom to exceed these dimensions.

“Instead of ligneous, it should be described as osseous, if that epithet is applicable to the stone fruits in general, which the substance of this fruit plainly equals in hardness.

“Gaertner says it is ‘valveless’ (‘avalue’), by which he means that it is indehiscent; and of course he applies this term to all legumens which are indehiscent. If, however, the name legumen be applied to such pericarps, it seems better to allow them to possess valves also, at least when the form of the two portions of the pericarpal wall is so well marked out, as in this case. Gaertner does not hesitate to place this pericarp among legumens; but, contrary to recent usage, he puts the Tonga bean among the drupes. He does not even consider the pericarp of the *Hymenæa* as a drupaceous legumen, but ranks it under the baccate legumens, along with the pericarp of the tamarind, the *Cassia fistula*, and the carob bean, the common character of which is the containing within the legumen a pulp, in which the seeds are imbedded.

“Gaertner does not take notice of the colour of this pod. It is

variously described by authors, as chocolate-coloured, liver-coloured, and chestnut-coloured; while the roughness of the surface is spoken of as resembling shagreen. There is another species of *Hymenæa* in which the external surface of the pericarp is studded with larger tubercles, whence it is named the *Hymenæa verrucosa*. In Nees von Esenbeck's large work, '*Icones Plantarum Medicinalium*,' the figure of the pod of the *Hymenæa Courbaril* exhibits veins on the surface. In our specimen, there is no appearance of anything of the kind. If such an appearance occur, it must be in the young pod.

"Gaertner says the seeds are from four to eight. It is a singular circumstance, that many of the earlier authors state that the number of the seeds is three. At first, I imagined that this idea had arisen from the figure of a large, broad pod, with three seeds, in Plumier's '*Description des Plantes de l'Amérique*,' being mistaken for his figure of the pod of the *Hymenæa*, which occurs in a different work, his '*Nova Plantarum Americanarum Genera*;' but I find that both Piso and Ray, whose works were published long before either of Plumier's, insist on three seeds, or three stones. In the pod before us, there are four prominent marks of seeds, and several other less prominent elevations, which seem to be the marks of seeds also. If there be really a tendency to no more than three seeds in so large a seed-vessel, it will prove additional evidence of the disposition to a transition from the legumen to the drupe, which this legumen so much resembles in its hardness.

"The seeds are truly called little bones. The black exterior, however, readily scales off in water, and the interior softens. If a specimen of the *resina animæ* fall within the plan of the Museum, I will be glad to present one. Meantime, specimens may be seen in the Museum of the College of Physicians; *viz.*, Nos. 1203, 1204, and 1205."

Rarer Plants of the Neighbourhood of Ripon.

A paper by Mr. James B. Davies, 'On the Rarer Plants found in the Neighbourhood of Ripon,' was read.

After giving a general account of the geological features of the district, illustrated by a map, Mr. Davies noticed the plants of interest. These were, *Scolopendrium vulgare*, *Bryonia dioica*, *Tamus communis*, *Colchicum autumnale*, *Littorella lacustris*, *Pilularia globulifera*, *Radiola Millegrana*, *Listera cordata*, *Lathræa squamaria*, *Convallaria multiflora*, *Paris quadrifolia*, *Melica nutans*, *Gagea lutea*, *Chlora perfoliata*, *Gentiana Amarella*, *Anchusa sempervirens*, *Ribes alpinum*,

Aconitum Napellus, *Atropa Belladonna*, *Chelidonium majus*, *Corydalis lutea*, *Impatiens Noli-me-tangere*, *Thalictrum majus*, *Primula farinosa*, *Carduus Marianus*, *Hottonia palustris*, and many other plants.

Melampyrum montanum, Johnst.

A paper by Daniel Oliver, jun., Esq., F.L.S, 'On *Melampyrum montanum*, *Johnst.*,' was read.

"This plant, as described in the 'Berwickshire Flora,' and mentioned in Babington's 'Manual' as a variety of *M. pratense*, I am inclined to believe, has been founded by Dr. Johnston on an examination of an insufficient series of examples of more or less distinct forms of *Melampyrum*.

"If I mistake not, the only station mentioned in the 'Berwickshire Flora' for this plant, there described as a new species, is by Cheviot; and I dare say the description may be quite comprehensive enough to include each one of the series which may there occur; but, I apprehend, the characters, 'smaller in all its parts,' and 'floral leaves quite entire,' are not essential distinctions of the plant, the smaller forms only of which, I would suggest, have been familiar to Dr. Johnston.

"Last year, I described (*Phytol.* iv. 678) a plant which I called *M. pratense*, var. *ericetorum*; and, in the same communication, hinted that its smaller forms might be identical with the Cheviot *M. montanum*.

"I am rather strengthened in this opinion by a series of specimens which I collected, last month, near the Wall-town Crags, Northumberland. An example or two, selected from these, accompany this notice. It will be observed that the floral leaves (bracts) are, in some of the larger instances of the plant, ovate-lanceolate, or almost ovate at the base, and deeply toothed; while the smaller ones accord more nearly with Dr. Johnston's *M. montanum*. Some of these appear to be similar to luxuriant specimens from Urrisbeg, in county Galway, Ireland, where they attain the most considerable size that I have observed. Irish specimens I also send herewith. I may add, that whatever name be applied to this plant, I cannot but think that some comprehensive characters, which would yet sufficiently distinguish it from *M. pratense*, at least as a marked variety, ought to be substituted for the book-characters of *M. montanum*."

Mr. M'Nab exhibited, from the Royal Botanic Garden, a number of plants, which had been recently presented to the Garden.

The following gentlemen were balloted for, and duly elected Ordinary Fellows :—Resident : Andrew Taylor, Esq., 31, Buccleuch Place, Edinburgh. Non-resident : Dr. Grierson, Thornhill, Dumfries-shire ; and T. Southwell, Esq., Holt Road, Falkenham, Norfolk.

M. Auguste Le Folis, Cherbourg, was elected a Foreign Member.

Mr. Alexander Osmond Black, Burton Street, London, was elected an Associate.

The Society then adjourned till the second Thursday of November.

NOTICES OF NEW BOOKS, &c.

'The Gardeners' Chronicle,' Edited by Professor Lindley, No. 36, September 3, 1853.

Our attention has been invited to a paper in the 'Gardeners' Chronicle,' in which, as it seems to the talented and venerable friend who hands us the newspaper, as well as to ourselves, there is a great confusion of terms and ideas, and hence, also, abundant germs of absolute error. To suppose that Professor Lindley would pen such an article, would be to erect a theory opposed to intrinsic evidence ; but the article goes forth to the world anonymously, the Professor himself being the avowed and advertised editor ; and, therefore, it is perfectly in accordance with usage to hold him responsible for the opinions expressed. We cite the article entire.

"The species of plants, like those of animals, appear to be eternal, so far as anything mundane can deserve that name. There is not the smallest reason to suppose that the olive of our days is different from that of Noah ; the *Asa dulcis* stamped upon the coins of Cyrene still flourishes around the site of that ancient city ; and the acorns figured among the sculptures of Nimroud seem to show that the same oak now grows on the mountains of Kurdistan as was known there in the days of Sardanapalus. There is not the slightest evidence to show that any species of plant has become extinct during the present order of things. All species have continued to propagate themselves by seeds, without losing their specific peculiarities ; some appointed law has rendered them and their several natures eternal.

"It would seem moreover that, with the exception of annuals and others of limited existence, the lives of the individual plants born from

such seed would be eternal also, if it were not for the many accidents to which they are exposed, and which eventually destroy them. Trees and other plants of a perennial nature are renovated annually ; annually receding from the point which was originally formed, and which in the nature of things must perish in time. The condition of their existence is a perpetual renewal of youth. In the proper sense of the word decrepitude cannot overtake them. The Iris creeps along the mud, ever receding from the starting point, renews itself as it advances, and leaves its original stem to die as its new shoots gain vigour ; in the course of centuries a single Iris might creep around the world itself, if it could only find mud in which to root. The oak annually forms new living matter over that which was previously formed, the seat of life incessantly retreating from the seat of death. When such a tree decays no injury is felt, because the centre which perishes is made good at the circumference, over which new life is perennially distributed. In the absence of accidents such a tree might have lived from the creation to this hour ; travellers have even believed that they had found in the forests of Brazil living trees that must have been born in the days of Homer. But here again inevitable accidents interfere, and the trees are prevented from being immortal.

“Species, then, are eternal ; and so would be the individuals sprung from their seeds, if it were not for accidental circumstances.

“But plants are multiplied otherwise than by seeds. The hyacinth and the garlic propagate naturally, not only by seeds, but also by the perpetual separation of their own limbs, known under the name of bulbs, their bulbs undergoing a similar natural process of dismemberment ; and so on for ever. The potato plant belongs to the same class. Another plant bends its branches to the ground ; the branches put forth roots, and as soon as these roots are established the connexion between parent and offspring is broken, and a new plant springs into independent existence. Of this we find familiar examples in the strawberry and the willow. Man turns this property to account by artificial processes of multiplication ; one tree he propagates by layers, another by cuttings planted in the ground. Going a step further he inserts a cutting of one individual upon the stem of some other individual of the same species, under the name of a bud or a scion, and thus obtains a vegetable twin.

“It is not contended, for there is nothing to show, that these artificial productions are more short-lived than either parent, provided the constitution of the two individuals is in perfect accordance. There is not the smallest evidence—it has not been even conjectured—that

if a seedling apple-tree is cut into two parts, and these parts are reunited by grafting, the duration of the tree will be shorter than it would have been in the absence of the operation.

"It is nevertheless believed by many that the races of some cultivated plants have but a brief duration, provided they are multiplied otherwise than by seeds. No one indeed pretends that the garlic of Ascalon has only a short life, although it has been thus propagated from the time when it bore the name of Shummin, and fed the labourers at the Pyramids; nor do we know that the bulb-bearing lily has been supposed to have less inherent vigour than if it were multiplied by seeds instead of bulbs. It is only among certain kinds of plants that exceptions to the great natural law of vegetation are supposed to exist. It is thought that although the wild potato possesses indefinite vitality, yet that the varieties of it which are brought into cultivation pass their lives circumscribed within very narrow limits; and the same doctrine has been held concerning fruit-trees. The great advocate of this view, the late Mr. Andrew Knight, rested his case upon the disappearance of certain kinds of apples and pears, once to be found in the orchards of Herefordshire, but now no longer to be met with. This he ascribed to cultivated varieties being naturally short-lived, and to an impossibility of arresting their gradual decay by any process of dismemberment; and following out this theory he strongly urged the necessity of renewing vitality by continually raising fresh varieties from seed. It is difficult to comprehend what train of reasoning led to this speculation. We know that wild plants may be propagated by dismemberment for an indefinite period; we know that when such wild plants spring up from seed the dismembering process still goes on and still without exhibiting symptoms of exhausted vitality; and yet if a plant grows in a garden, and is brought under the direct control of man, the power is thought to be lost, or so much impaired that indefinite multiplication no longer becomes possible. Can this be true? Most assuredly the cases adduced in support of the doctrine are susceptible of another explanation, perfectly consistent with the general laws of vegetation.

"That renewal by seed will not restore what is called exhausted vitality, was sufficiently proved by the experiments with potatoes after the blight made its appearance. We were assured by an ingenious writer in one of the daily papers that the constitutional power of the potato was on the decline; in other words, that the lives of individuals was approaching their end; that the blight arose in consequence, and that a certain remedy would be the renewal of the exist-

ing races by sowing seeds. Hundreds joined eagerly in what proved to be the vain pursuit. A worthy armourer at Solingen even published an elaborate pamphlet in support of the idea. *Nein mehr Hungersnoth*—no more famine—was his audacious motto—a prediction wofully falsified by the result, for the seedling potatoes were, if possible, more diseased than their parents.

“So many persons, however, disregarding what we presume to think the preponderating weight of evidence to the contrary, still continue to look upon the question as one open to further discussion, that a learned German Scientific Society has determined to make it the subject of further and more elaborate examination.

“A committee appointed under the Demidoff foundation in Berlin, has just announced that a prize of £30 (200 thalers) is offered for the best essay upon the duration of life in plants propagated otherwise than by seed. The question to which competitors must address themselves may be thus freely translated :—‘Is the life of an individual plant, in its widest sense, that is to say, of a plant itself raised from seed and then propagated otherwise than by seed (by cuttings, layers, buds, grafts, &c.), unlimited in duration, and destructible only by accidental or external unfavourable circumstances, before the extinction of the species itself? or is the life of such individual limited, and to a certain definite extent shorter than the duration of the species?’

“Competitors are expected to give, in addition to any unpublished cases, the fullest possible collection and examination of published facts relating to the degeneracy or total extinction of seedlings, preserved and propagated otherwise than by seed, and more particularly of seedling fruits cultivated in Europe, *viz.*, apples, pears, quinces, medlars, plums, cherries, apricots, peaches, almonds, figs, mulberries, the different kinds of orange, olives, walnuts, filberts, grapes, gooseberries, currants, raspberries, and strawberries; and the sources from which the facts are taken must be stated. Attention must also be paid to the circumstances under which the degeneration of the plants reported on occurred; the climate and soil in which they grew, the treatment and care they received, so far as these can affect the answer to be given to the question, and any evidence relating to them which can be found.

“It is announced that the essays for the prize may be written in English, French, German, Italian, or Latin, and must be delivered before the 1st of March, 1854, to Dr. Nees von Esenbeck, President of the Academy of Naturalists at Breslau. Each essay must have a motto prefixed, and in an accompanying envelope the name of the

writer must be given. The result of the award is to be made known in the 'Bonplandia' newspaper of the 17th June, 1854, and the successful essay will be printed in the Transactions of the Academy Naturæ Curiosorum. Full particulars will be found in the 'Allgemeine Gartenzeitung' for the 30th July, of the present year.

"Since it is obvious that no special experiments can now be instituted for the purpose of testing this theory, the attention of the essayists will necessarily be confined to a diligent accumulation of evidence, and to the conclusions which it renders necessary. We dare say the proposal will find respondents among men of leisure who have access to large libraries, and we venture to hope that they will be able to settle so vexed a subject. We trust they will take care not to confound the duration of natural seedlings with that of vegetable mules, which is a wholly different question."

In this paper, it appears to us that the terms "kinds," "species," "races," "varieties," and "individuals" are employed both without any just appreciation of the meanings which they are usually intended to convey, and without any attempt to distinguish between the natural conditions of either. A "race," like the term "alliance," or "family," or "natural order," or "genus," implies to the ear of every botanist a plurality of "species:" a "species" implies a plurality of "individuals" which agree in reproducing their own likeness, again and again, through a succession of generations: a "kind" is a vague and unbotanical term; the only definite meaning that can be attached to it is, "a peculiar individual, raised from the seed of a species," as a golden pippin might be called a good "kind" of apple: a "variety" is the deviation of *many* individuals, undoubtedly the descendants of one species, from the normal type of colour or form; thus, the white individuals of *Geranium Robertianum* constitute a variety as regards colour, and the *Peloria* individuals of *Linaria vulgaris* constitute a variety as regards form. We do not attempt to give this as a novel or scientific definition of the terms, but as a definition which exhibits sufficiently well the absence of concord between the terms, and exhibits, also, as injudicious, the practice of using them indifferently. From the paper before us the terms "kinds," "races," and "varieties" should be erased, as irrelevant, and the question discussed simply in reference to the more definite ideas, "species" and "individuals."

Now, a line being drawn between "species" and "individuals," we cannot accept the author's mode of reasoning from one to the other. "Species are eternal," he says; and he goes on to argue,

that therefore Andrew Knight was wrong in stating that individuals were perishable. Now, with regard to the first position, that "species are eternal," we take the liberty of stating that this assertion requires modification. We are well aware how great and how just is the reputation of him from whom the assertion has been borrowed. Linneus, in his '*Philosophia Botanica*,' says:—

"Species tot numeramus, quot diversæ formæ in principio sunt creatæ.

"Species tot sunt, quot diversas formas ab initio produxit Infinitum Ens; quæ formæ, secundum generationis inditas leges, producere plures, at sibi semper similes. Ergo species tot sunt, quot diversæ formæ s. structuræ hodiernum occurrunt.

"Oratio de *Telluris habitabilis incremento*, Ups. et Leyd. edita, consequentias plurimas super hoc argumentum edocuit." *

And, again, with reference to the "Iris creeping round the world," he continues:—

"Radix extenditur in herbam inque infinitum, usque dum apice rumpantur integumenta in florem, formantque semen contiguum, ultimum terminum vegetationis; Hoc semen cadit, prognascitur, et in diverso loco quasi plantam continuat; hinc simillimam sobolem producit, uti Arbor ramum, Ramus gemmam, Gemma herbam; ergo Continuatio est Generatio plantarum."

Linneus appears to have been taken as an absolute authority, and his idea of the species now extant having existed from the beginning to have been adopted without the slightest modification. But the question must arise, in the mind of every one capable of a moment's reflection, Is this assertion true? We think not. Geologists have shown that the earth has undergone no changes but those which are still in progress; and yet we believe the *Megatherium*, the *Mylo-don*, the *Pterodactylus*, did once exist, and do not now exist. We believe, also, that all the plants of the coal-strata did once exist, and do not now exist. We believe, also, that thousands of species exist now which did not exist with the plants of the coal-strata; and we ground this opinion on the fact, that no traces of such recent species exist in the strata to which we refer; and those strata are imperishable records of what did once exist; and we find no evidence to show that any extraordinary convulsion caused their destruction; indeed, we know their destruction was neither sudden

* A translation of this 'Oratio' will be found in Sir J. E. Smith's '*Tracts on Natural History*.'

nor simultaneous, but that it was spread over thousands of years. Our author will probably at this point invoke the waters of the deluge, in order to drown this view of the case; but if there be one feature in the biblical history of that event more prominent than the rest, it is the especial care taken by the Almighty that not a "species" should perish; so that naturalists are, as it were, cautioned, on the very threshold of the inquiry, against the introduction of the Bible in support of their speculations. Now, it must be patent to the most ordinary capacity, either that the Megatherium, Pterodactylus, and the entire coal series of vegetables actually exist at the present moment, or that the Linnean hypothesis of the eternal duration of species is altogether futile.

We now arrive at the second division of the Editor's leader, that which appears penned in express opposition to the views of Mr. Knight; and here we think the writer equally in error.

There are certain plants, such, for instance, as the plum, the pear, the apple, the bramble, the rose, &c., which accompany man in his migrations, and adopt his home for their own. Most of these have obtained his peculiar regard from the value of their fruit, and all are subject to that deviation from typical and original character, which results from domestication. In reproducing these plants from seed, it is notorious that the descendant is not the exact image of the parent. For instance, the stone of a greengage, the pip of a jargonel or Ribstone pippin, the seed of a *Rubus Grabowskii* or a *Rosa Devoniensis*, do not necessarily reproduce their kind: such a fact *might* result, but there is no law by which it *must* result; and those who have studied the matter, and practically tested it, well know that such a fact would be opposed to the ordinary result. There is every human probability that six mature seeds of either of these plants would produce plants not merely unlike the parent, but unlike each other. The Bombi, or humble bees, are the great agents in the creation of species of brambles; in this work leaving our valued *collaborateurs*, Lees, Babington, and Bell-Salter, far, far behind: and to the same instrumentality we are probably indebted for some of our choicest apples. How, then, is the likeness of the parent to be perpetuated? We answer, by taking an integral portion of that parent, *viz.*, a cutting or bud, growing it either in the ground, or grafting it on another stock. By such a process, greengages and jargonels are indefinitely multiplied, until a seedling plant may have thousands of detached members, in all respects the image of itself.

An individual being thus indefinitely multiplied, and the existence of each portion of the individual thus commencing, as it were, *de novo*, it seems not unlikely that we should forget the bond of unity existing between the disjointed members, or that we should consider each member in the light of an independent being. This idea, however, is not logical. It needs but a moment's reflection to be assured that the individual is merely dismembered; and that if perchance it has produced offspring, those offspring belong altogether to another category, each having an individuality of its own. Thus, for example, the offspring of a nonpareil would perchance resemble a golden pippin, a golden knob, a Ribstone pippin, a Downton pippin, or some other pippin. It certainly would not be either of these, because such pippins, like the nonpareil, are simply individuals; and it as certainly would not be a nonpareil, because the term "nonpareil" attaches to an individual only, and its disjointed members. We thus arrive at the conclusion that those apples, which Mr. Knight said were dying out, or would die out, were individuals only, and have nothing whatever in common with species, not being capable of reproducing their kind. To this we have only to add, that the experience of every gray-headed horticulturist with whom we have conversed, whether in Sussex, Devonshire, or Herefordshire, confirms and corroborates Mr. Knight's statement, and leads us to regard him as the most philosophical, as well as the soundest practical, horticulturist that the world has produced; and we hold his recommendation to continue the multiplication of individuals from seed, with a view to securing a succession of useful plants and beautiful flowers, to be the very keystone of modern horticulture, and, more than that, the main source of that revenue which is accruing from the publication of such works as the 'Gardeners' Chronicle.'

The following passage, also, is as erroneous botanically as those we have already cited are fallacious in a geological or horticultural point of view:—"Another plant bends its branches to the ground; the branches put forth roots, and as soon as these roots are established the connexion between parent and offspring is broken, and a new plant springs into independent existence." Now, the banyan-tree is the most familiar instance of this peculiarity, yet serves but as the type of a thousand others in which these supplementary roots, put forth by the branches, serve to support the parent, and prolong an existence with which their own is absolutely identified. It is true that the 'Gardeners' Chronicle' does not claim to be regarded as an oracle on scientific questions; but some care should be taken that

no statement in the editorial articles be at variance with scientific truth.

‘*Terra Lindisfarnensis. The Natural History of the Eastern Borders.* By GEORGE JOHNSTON, M.D. Edin.; LL.D. of Marischal College, Aberdeen; Fellow of the Royal College of Surgeons of Edinburgh; &c. Vol. I. The Botany. London: Van Voorst. 1853. Price 10s. 6d.’

This is a book which we take up with the most entire good will, and which we have read with pleasure and instruction; yet there are a few particulars which, as conscientious critics, we must mention with disapprobation:—1st. The title may be intelligible, nay, even expressive, to a resident at Berwick-upon-Tweed; but in these southern regions its meaning is near akin to a riddle. We will, therefore, state, for the benefit of the uninitiated, that “the Eastern borders comprehend the whole of Berwickshire, the liberties of Berwick, North Durham, and the immediately adjacent parts of Northumberland and Durham.” 2ndly. We do not admire the illustrations, although we learn that some of them are from a lady’s pencil. The pictorial ones are out of perspective, and the botanical ones are unbotanical. The blossoms of the *Hieracia*, Plates II., III., and IV., convey no idea even of the genus. The *repetition* of the woodcuts is also contrary to custom. 3rdly. We do not like the phraseology. It is, perhaps, provincial; but then, Dr. Johnston writes for the kingdom at large, and not exclusively for the inhabitants of the Eastern Borders; and, supposing it were so,—supposing he addressed himself solely to his neighbours,—it were but a poor compliment to those neighbours to address them in bad or awkward English. In one paragraph, the following phrases, or sentences, occur:—“Too *tenuous* for manhood;” “*mind*ed head;” “*incapableness*;” “hinder the worthiest to examine;” “Therefore, reader, do not go away repelled by the seeming littleness of what *you* may herein read, make the subject of *thyself* greater and worthier, for I would fain solicit *thee* to a pupilage that may teach *you*;” &c., &c. The paragraph in which these expressions occur is full of noble sentiments, indeed it is the best in the book, and well deserves a little more trouble than has been bestowed upon it. We have compressed the criticisms into the fewest possible words, being desirous of hastening on to the more agreeable task of praising; and we assure our readers that we may

bestow praise without stint, and without qualification, on this really interesting volume.

The design of that portion of the work now published, is to give a complete list of the plants of the district indicated. These are distinguished as the *indigenous*, the *naturalized*, and the *cultivated*, each distinction being indicated by a different type, and a different set of numerals. Besides these three main divisions, there are a few stragglers and extirpated species, given in foot-notes. These distinctions are always, in some measure, arbitrary: few of us can totally banish feelings of favouritism or distrust, when engaged in this task of assigning its exact rank to each species as it comes before us. The following is a summary of the Eastern-Borders phanerogamic Flora:—

	Indigenous.	Naturalized.	Cultivated.	Stragglers.	
Endogens....	532	37	30	41	= 640
Exogens	168	4	8	9	= 189
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	700	41	38	50	= 829

The name of each species is accompanied by some observation; sometimes a mere local appellation, or a habitat, but for the most part a more extended note, embracing diversified and agreeable information, both borrowed and original. We select examples.

“*Papaver Rhœas*. William Turner writes in 1551:—‘This kind is called in English corn-rose or red corn-rose, and with us it groweth much amongst the corn and barley.’ It has been very sensibly reduced both in quantity, and its distribution, within the present century; but, in some farms, as in Holy-Island, the poppy still abounds to excess, and imparts a gay hilarity to the sombre cornfields. It disappears from infested fields when these are laid down in grass, and endures nowhere long if the soil is undisturbed; but let the ground be disturbed anew by the plough or the spade, no matter at what distant interval, the weed reappears in rich profusion. Of this fact we had an illustration when the railway was made from Berwick to Cockburnspath, and from Tweedmouth to Kelso. The sides of the cut were, in many places, literally clothed in scarlet; and this was especially the case where the line had been cut through those gravel knolls which some conjecture were deposited towards the termination of what has been called the glacial epoch. Nor need we be hindered from entertaining the belief that the poppy was amongst the first plants that occupied the naked surface of those knolls, burying therein

the seeds of primeval crops to be preserved intact until accident shall bring them up and within the influence of vivifying agents. There is a far-distant antiquity even in one of its provincial names. In the neighbourhood of Gordon I heard this weed called *Cockeno*,—evidently from ‘coch,’ the Celtic for scarlet, and hence the name is probably coeval with the early inhabitation of the district. In other parts of Derbyshire the plant is called *Cock’s-combs*. About Wooler it was wont to be called the *Thunder-flower*, or *Lightnings*; and children were afraid to pluck the flower, for if, perchance, the petals fell off in the act, the gatherer became more liable to be struck with lightning; nor was the risk small, for the deciduousness of the petals is almost proverbial. ‘And it is called *Papaver erraticum* in Latin, in Greek, *Rhœas*, because the flour falleth away hastily.’ Turner. — When cultivated, it becomes a beautiful annual. ‘In hortis, ubi florum colore pulcherrime ludit, nempe miniato, sanguineo, purpureo, carneo, niveo toto, carneo per limbum albo, &c.’ Haller, *Flor. Jenen.* p. 70.” —P. 30.

The following extract is only a portion of the observations under *Cardamine pratensis*. It is copied because we consider it botanically valuable.

“*Cardamine pratensis*. In autumn little bunches of leaves may be seen often to grow from the upper surface of the old but perfectly fresh leaves, each bunch throwing out a radical fibre that creeps along in search of a soil proper to take root in. These parasitical bunches are young plants, and will detach themselves either when the root-fibre has reached the soft ground, or when the parent leaf has decayed.” —P. 33.

The following learned remarks on the metamorphosis of cereals will not be read without a smile at the hypothesis of the vestigians.

“*Agrostemma Githago* = *Lychnis Githago* = *Githago segetum*, Don, *Gard. Dict.* i. 417.—Corn Cockle: Popple or Pawple.—Corn-fields, a showy but noxious weed; and hence its name is often used figuratively in composition. ‘Some have made virginity the corn, and marriage the cockle.’ Fuller, *Ch. Hist.* i. p. 294.

‘Good seed degenerates, and oft obeys
The soil’s disease, and into cockle strays.’

Donne.

Donne, in this couplet, asserts a metamorphosis, the reality of which our early herbalists never doubted. Wheat, they believed, sown in sour land became rye in the second year, and two years after went

into darnel. Barley under a similar treatment passed into oats ; and cereals in general might become the very weeds that choked the husbandman's expectations. Of the Blewbottle or Bleublaws, Turner says :—' It groweth much among Rye : wherefore I thynke, that good ry, in an euell and unseasonable yere doth go out of kynde in to thys wede.'—In relation to this subject the curious reader may consult Dr. Weissenborn's account of the transformation of oats into rye in Charlesworth's ' Magazine of Natural History,' i. p. 574 ; ii. p. 670 : ' Vestiges of Creation,' p. 225, and the Sequel, p. 111 : ' Notes and Queries,' vi. p. 7.—Cockle, says Richardson, is from the ' A. S. coccel, which Skinner thinks is from Ceocan, to choke, because it chokes the corn.' This is to mistake the character of this weed : it does not choke the corn, but its injuriousness arises from the seeds being mingled and ground with the grain and communicating an unwholesome quality to the flour. The name undoubtedly has the same root as Cockeno (p. 30). Indeed Bailey makes Cockle the synonym of the Corn-Rose ; and Johnson defines it to be ' a species of poppy. The seeds are reckoned a remedy for toothache.'—P. 41.

(To be continued).

A few Notes on the Botany of Jersey ; including a List of Additions to Mr. Babington's ' Primitiæ Floræ Sarnicæ,' by M. Piquet.
By N. B. WARD, Esq., F.R.S., &c.

I HAVE just returned from a tour of two or three weeks to Jersey ; and having been favoured with a note of introduction to one of the resident botanists, M. Piquet, of St. Helier's, was kindly taken by him to (with me) the great object of attraction,—the *Gymnogramma leptophylla*. I saw it growing, as stated in the ' Phytologist,' on a bank with a south-western aspect, not densely shaded by trees, as is the case in most of the Jersey lanes, but protected from the direct rays of the sun, by the dwarf vegetation of the bank, which, from the constant oozing of a small stream, is sufficiently damp for the growth of *Marchantia*, with here and there a patch of *Fissidens bryoides*. I was shown two stations of this interesting plant by M. Piquet, and a third, about a mile from the former, by the Rev. W. Wait. It doubtless will be found in other localities, as the climate must nearly approach that of the South of France, and of Italy, where the *Gymnogramma* abounds. The next plant to which I directed my

attention was *Asplenium lanceolatum*, as I had found more trouble in growing this plant, either in or out of a case, than with most other ferns, either British or foreign. This plant is far more abundant in the western than in the eastern part of the Island; and, somewhat to my surprise, I found it flourishing under very different conditions of light and moisture. Near Grosnez, it is found growing in the crevices of the stone walls, fully exposed to the blaze of the sun, scarcely attaining, however, the height of more than one or two inches, and with very crisp and curled fronds. It attains its greatest development on the top of densely shaded sandstone banks at St. Aubin's, where its fronds are a foot in height, and the soil very dry; and likewise in the inside of wells, one or two of which were completely lined with it, where it must have been growing undisturbed for years, from the great number of fronds springing from a single root. One specimen that I gathered, in the inside of a well between Roselle and Boulay Bay, had 120 more or less perfect fronds upon it, besides portions of the footstalks of sixty or seventy others. These fronds were twelve or thirteen inches in height. In all cases the plants are surrounded by a mild and humid atmosphere, free from soot or dust; and both the *Asplenium* and *Gymnogramma* would succeed best with us with a little protection. This will not be a matter of surprise, when the mildness of the climate of Jersey is taken into account, where the giant cabbage grows to the height of twelve or thirteen feet, the mellow pears attain a weight of two or three pounds, and the *Hydrangea* is loaded with many hundred heads of flowers.*

The phænogamous vegetation of Jersey is rather disappointing to one who, like myself, has been accustomed to botanize on the chalk-hills in Kent, from the total absence of many of our most interesting ornamental plants. No *Campanula* is to be seen, and very few of the *Orchideæ*, &c. But upon this part of the subject I need not dilate, as M. Piquet has most kindly favoured me with the result of his long-continued and patient observations, in a list, for which, I am sure, your readers will be much indebted to him. The mosses were mostly dried up; but I was much struck with the pictorial effect of the *Didymodon purpureum* on the slope of a sunny hill, where the furze had been cut and burnt.† When I first saw the plant, I thought it was *Funaria hygrometrica*, which is frequently found under similar

* Mr. S. Curtis, of Roselle, mentioned to me one specimen in which he had counted 2700.

† Nearly two acres were covered with this moss, with a few patches intermixed of *Sedum anglicum*, whose leaves rivalled the capsules of the moss in colour.

conditions, as in open places in woods where charcoal has been burnt.

I would direct the attention of the botanist to the marine Algæ, which would, I am convinced, yield an abundant harvest. Limited as my researches were to a small portion of the coast, *viz.*, between St. Aubin's and Portelet Bays, a space of three or four miles in extent, I yet collected more than sixty species, and amongst them *Griffithsia barbata*. The study of these plants is most interesting, as many species are to be found in every possible state of development, according as they occur near high- or low-water mark, or on different aspects of the rocks on which they are growing, &c. Thus, the *Cladostephus spongiosus*, which, in the upper pools, appears to grow solely to afford attachment to species of *Conserva*, *Cladophora* and *Ceramium*, in the pools near low-water mark, attains twice the size, and is unincumbered with parasites. But the submarine vegetation is worthy of all admiration. Nothing can exceed the beauty of the groves of *Halidrys siliquosa*, here ten or twelve feet in height; the *Chorda Filum*, attaining a much greater length, with the upper portions of its stems floating, in the most graceful curves, upon the surface; and the densely packed and lively green leaves of *Zostera marina*; all affording food and support to thousands of small animals, and all pleasing in their turn.

But I must close my imperfect sketch, well satisfied if others be tempted to carry out these investigations to a greater extent than I was enabled to do.

I cannot omit recording my obligations to Dr. Robert Ball, of Dublin, who kindly furnished me with one of his naturalists' dredges,* which, when compared with the ordinary oyster-dredge, does three times the work with half the labour. I have likewise to thank Miss Turner, of Gorey, for specimens of *Griffithsia barbata*, *Daysea venusta*, and many other Algæ.

I conclude with M. Piquet's List of Plants found in Jersey, but not mentioned by Mr. Babington as natives of that Island, although a few of them are recorded by that botanist as occurring in the other Channel Islands.

Those species supposed by M. Piquet to have been either naturalized, or in any respect doubtful natives, are marked by a star (*); and those which occur in the other Channel Islands, as well as in Jersey, by a dagger (+). The list includes sixty-six flowering plants, and one fern.

* Described by Harvey, in the 'Sea-side Book.'

- *Clematis Vitalba*, L. Growing on a hedge in St. Aubin's Bay.
Barbarea præcox, Br. Frequent in waste places.
Camelina sativa, Crantz. St. Saviour's Valley.
†*Sinapis tenuifolia*, Br. St. Ouen's Bay, and the Quenvais.
†*Crambe maritima*, L. St. Ouen's Bay, on the shingle.
Silene inflata, Sm. St. Clement's and St. Ouen's Bays ; rare.
†*Silene quinquevulnera*, L. St. Aubin's Bay ; very scarce.
**Silene Armeria*, L. In a lane near La Haule.
Saponaria officinalis, L. St. Saviour's ; rare.
Elatine hexandra, DC. Town Mill-ponds.
Althæa officinalis, L. St. Clement's Bay ; scarce.
**Geranium striatum*. St. Martin's, in hedges.
Melilotus officinalis, Lam. St. Aubin's Bay.
Lathyrus Aphaca, L. St. Peter's, and at Trinity ; rare.
**Lathyrus latifolius*, L. St. Helier's.
†*Prunus Cerasus*, L. In woods ; frequent.
**Potentilla hirta*, L. On a wall near Millbrook.
Agrimonia Eupatoria, L. Frequent on the coast.
**Cenothera biennis*, L. Greve d'Azette.
Myriophyllum spicatum, L. St. Ouen's Pond.
†*Chrysosplenium oppositifolium*, L. St. Saviour's Valley, &c.
†*Cenanthe pimpinelloides*, L. Near St. Ouen's Pond.
†*Galium saxatile*, L. Bouley Bay, Noirmont, &c.
Bidens cernua, L. St. Laurence Marsh.
†*Pyrethrum inodorum*, Sm., var. *β. maritimum*. At. Petit Port.
Centaurea Jacea, L. St. Ouen's Bay.
†*Cichorium Intybus*, L. Gorey Common, &c.
Apargia autumnalis, Willd. A proliferous variety of this plant is found at St. Ouen's Bay, in which the outer florets are very much elongated, and the plant has the appearance of a *Daucus* in seed.
Hypochæris radicata, L. Found in the same state as the preceding, and in the same locality.
**Tragopogon porrifolius*, L. On walls, in various places.
†*Ligustrum vulgare*, L. Growing wild, at the Corbierre.
Lycium europæum, L. In various places, St. Aubin's Bay.
Physalis Alkekengi, L. Fields at Mount Neron.
Orobanche arenaria ? St. Ouen's Bay, on *Eryngium maritimum*.
Linaria Cymbalaria, Mill. St. Clement's Lane.
†*Lycopus europæus*, L. St. Saviour's Valley, &c.
Galeobdolon luteum, Huds. St. Catherine's Bay.

- †*Lamium amplexicaule*, L. St. Brelade and St. Clement's.
Teucrium Chamædrys, L. Lane at Trinity.
 †*Atriplex deltoidea*, Bab. Near St. Helier's.
 †*Atriplex rosea*, L. St. Ouen's Bay.
Polygonum amphibium, L., var. *β. terrestre*. Margin of ponds ; frequent.
 †*Polygonum lapathifolium*, L. St. Clement's Bay.
Polygonum minus, Huds. St. Laurence Marsh.
 †*Polygonum maritimum*, L. St. Aubin's Bay.
Salix viminalis, L. St. Catherine's Bay.
Orchis Morio, L. St. Ouen's and Rozel ; rare.
 †*Listera ovata*, Br. Valley des Vaux ; scarce.
Allium ursinum, L. In woods, St. Brelade.
 **Muscari comosum*, Mill. In a field near the first Martello tower, St. Aubin's Bay.
 †*Juncus glaucus*, Ehrh. St. Ouen's Bay.
 †*Juncus maritimus*, Sm. Near Petit Port, and Pointe des Pas.
 †*Luzula campestris*, Br., var. *β. congesta*. St. Brelade and St. Ouen.
 †*Typha latifolia*, L. St. Peter's Marsh.
Sparganium simplex, Huds. St. Laurence Marsh.
 †*Zannichellia palustris*, L. In brooks, St. Clement's Bay.
Cladium Mariscus, Br. St. Ouen's Bay.
 †*Carex stellulata*, Gooden. Bouley Bay, &c.
Carex binervis, Sm. Bonnenuit, and near Rozel.
Setaria verticillata, Beauv. The Marais, St. Ouen.
Agrostis Spica-venti, L. Bouley Bay ; very rare.
 †*Arundo Epigejos*, L. St. Catherine's Bay.
Bromus secalinus, L. The Quenvais.
Bromus arvensis, L. Meadows near St. Ouen's Pond.
Lolium multiflorum, Lam. Greve d'Azette, and Trinity.
Digitaria sanguinalis, Scop. St. Saviour's ; very scarce.
Gymnogramma leptophylla. At St. Laurence, and near La Haule.

N. B. WARD.

Clapham Rise,
 September 20, 1853.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-ninth Sitting.—Saturday, September 24, 1853.—MR. NEWMAN, President, in the chair.

The following communications, received during the last few weeks, were read :—

Rosa hibernica in Cumberland.

“I believe there is no published report of *Rosa hibernica* growing wild in England. I observed a single bush of it in 1845, by the road above Crummock Water, Cumberland, in the way from Buttermere to Scale Hill. I had the pleasure of confirming the discovery in June last, by finding several bushes in a hedge near Lorton, in the same neighbourhood; and Mr. Robinson, of Whinfell Hall, has since found the species in many places in the Vale of Lorton, and towards Scale Hill.”—*W. Borrer; Henfield, September 20, 1853.*

New Station for Teucrium Botrys.

“*Teucrium Botrys* was shown me about a fortnight since, by its discoverer there, Mr. Arthur Stedman, on Bagley Hill, Bookham, Surrey, about three miles, ‘as the crow flies,’ from the place where it was originally discovered, between Betchworth and Headley. Mr. Stedman has observed it in three spots, some growing on cultivated land, but most of it among thin grass on bushy hill-sides. Surely the discovery of this additional station tends to remove all doubt of the species being truly indigenous. I wish some one would seek for it about Saunderstead, as Mr. Anderson, late Curator of Chelsea Garden, showed me, many years ago, some plants in the Garden said to have been brought from that neighbourhood.”—*Id.*

Carex punctata in Ireland.

“It may interest some readers of the ‘Phytologist’ to know that *Carex punctata*, *Gaudin*, grows in Co. Kerry, Ireland. It is one of the most interesting of the many interesting plants which I brought home, last month, from the Dingle peninsula. It occurred near the mouth of the harbour, about a mile or so from Dingle, near a tower

occupied by the revenue-service, I believe. From what has been written and said respecting this *Carex* and its allies, it is, doubtless, known that unusual caution is requisite when it is under consideration. I may say, however, that, in the present case, I feel perhaps no doubt but that this is the *C. punctata* of those English botanists who know the Guernsey plant, and of Scandinavian collections, as I judge from a Norwegian example, which I possess, from Southern Norway, from Prof. Blytt, and the figure in Andersen's *Plantæ Scand.*, which, so far as I have seen, agree well enough. Wm. Borrer and C. C. Babington confirm my name. I was not aware that any doubt attached to the Menai-Straits station, mentioned in our Manuals; but, from what W. Borrer tells me, in a letter, I find it must be received with a degree of dubiety (this may, however, apply to but *one* locality by the Straits, if there be *two*). The station near Dingle is, so far as I know, the only satisfactory locality for the plant in Ireland, if not in the British Islands, exclusive of the Sarnian group. (See H. C. Watson's remark, in 'Cybele,' on the Cornish habitat). It seems, I may add, to differ at *first sight* from the nearly allied *Carex distans*, and may, perhaps, admit of a clear and specific distinction, in the *longer exerted* peduncles of the *cylindrical* fertile spikes of *patent, pale* fruit."—*D. Oliver, jun.*; *Newcastle-on-Tyne, September 23, 1853.*

Agrimonia odorata in Kerry.

"Another interesting plant, which I gathered in Kerry, new to the South of Ireland, is what I consider to be *Agrimonia odorata*, *Ait.* I collected but two examples, I think, stopping the conveyance for the purpose, by the roadside to the north of Dingle Bay. C. C. Babington, to whom I sent a small specimen, and W. W. Newbould, confirm my opinion, without speaking positively; the example not being, I think, in fruit, when its more apparent distinction presents itself."—*Id.*

Notes on a few Devonshire Plants.

"Perhaps it may be worth while to mention a few Devonshire plants which I gathered in June, during a visit to Harpford, a country village, situated about three miles and a half from Sidmouth, and the same from Ottery St. Mary. They have all been enumerated in the 'New Botanist's Guide,' in the list for Devon; but, with the exception of *Ruscus aculeatus* and *Lathyrus Aphaca*, the localities, so far as I am aware, have not been reported before for that part of

Devon. *Corydalis lutea*: under a wall, in one or two places, at Harpford; doubtless a garden escape. *Barbarea præcox*? a solitary specimen, gathered on the roadside, by a rivulet, between Harpford and Sidmouth. *Coronopus didyma*: very abundant in the adjoining village of Newton Poppleford, outside the garden walls. It was quite rare at Harpford, though occasionally seen. *Lepidium Smithii*: on a sandstone rock near Harpford. I only found one specimen; but, as the rock crumbled down, I think it probable that other plants lay concealed underneath. *Hypericum Androsæmum*: not unfrequent in Harpford Wood, and other places. *Arenaria marina*: on the sea-coast at Sidmouth. *Ulex nanus*: on the Beacon and Peak Hills, both the highest ground in that neighbourhood. The plants did not reach to the summit, and were sheltered by the banks from the sea breezes. *Lathyrus Aphaca* still retains its habitat on Sidmouth cliffs, growing, in great luxuriance, amongst *Lotus corniculatus* and *Anthyllis Vulneraria*. *Cotyledon Umbilicus*: in every hedgebank and lane at Harpford. Some of the specimens were nineteen inches in length. *Fœniculum vulgare* I did not meet with at Sidmouth, but gathered it on the old city walls at Exeter, the same habitat where *Bromus madritensis* grows. *Fedia dentata* was not unfrequent on the sandstone about Harpford. *Conyza squarrosa*: in Harpford Wood, and other places. *Anthemis nobilis*: plentiful in some spots on the Beacon and Peak Hills. I was unable, from inquiry, to ascertain the height of these hills, but it was generally supposed they might be between eight and nine hundred feet. *Lobelia urens*: last autumn, a specimen was gathered on the Beacon, or 'East Hill,' as it is sometimes called. This is its nearest habitat to Ottery St. Mary; but, owing to the unfavourable weather, I did not get to it, and it was early for flowers. This was the case with *Cuscuta Epithymum*, whose red threads nearly choked *Galium saxatile* and *Ulex nanus*. *Anchusa sempervirens*, with its bright blue flowers, attracted the eye in many places in the lanes about Harpford. It grew plentifully on the roadside near Ottery St. Mary, as well as near Sidmouth. I could not find that this beautiful weed was cultivated in the cottagers' gardens. *Lycopus europæus* we found at Sidmouth. *Galeobdolon luteum* was not uncommon on the hedgebanks, and in Harpford Wood. *Iris fœtidissima* was frequent enough to remind us of Sir William Hooker's objections to it. *Arenaria maritima*, α ., was very fine on Sidmouth cliffs. *Ruscus aculeatus* grew plentifully in Harpford Wood, though it seemed to select particular spots. The country people called it 'knee holly,' from its height. It is generally

used in that neighbourhood to ornament the churches with its beautiful berries at Christmas. Nothing could exceed the magnificence of the *Digitalis* in all quarters: we found some fine white-flowered plants, and also a white variety of *Ajuga reptans*. *Festuca bromoides* and *F. pseudo-myurus* grew on walls at Harpford and Sidmouth. I did not meet with any unusual or marked variety in ferns. They were all of the commoner species, but in size and luxuriance far surpassed any I had ever seen. I was much interested in discovering, on an ash-tree in Harpford Wood, a new lichen,—*Lecidea leucoplaca* of Chevallier, as a friend, who is conversant with the species, informs me it is called. *Sticta pulmonaria* of Hooker also grew on the same tree. The fronds were remarkably large, and some in fructification.”—*M. M. Atwood; Clifton Vale, Bristol, August 2, 1853.*

Lastrea Filix-mas and Ophioglossum vulgatum used in Medicine.

“I send you an extract from ‘The New Homœopathic Pharmacopœia and Posology:’—‘Tincture of Polypodium Filix-mas.—We gather the plant in the summer months. That which grows on stony declivities towards the North is considered the most efficacious. Of the recently dug roots we take the inner marrow, and we likewise take the youngest rudimentary leaves which are neither withered nor gangrened, of a bright green colour, a strong sweetish and offensive smell, and similar taste, which afterwards becomes bitterish, acerb, and slightly astringent. Both are stripped of their brown epidermis, after which we prepare according to class 2,’ &c.

“In a part of Herefordshire which is quite on the borders of Worcestershire, and in the parish of Whitbourne, the country people, in the spring, make what they call ‘May ointment,’ one of the ingredients in it being the adder’s-tongue fern (*Ophioglossum vulgatum*). It grows plentifully in a meadow in that district, and has been long in use as an important part of the ointment, which is composed of a variety of herbs, and is reckoned a panacea for bruises, tumours, &c. The leaves and stems are the parts used of the *Ophioglossum*.”—*Id.*; August 6, 1853.

New Locality for Cystopteris montana.

“Previously to my setting off for Scotland, on the 1st of this month, I was not able to get any information respecting the locality of *Cystopteris montana*, more than I obtained from the pages of the ‘Phytologist;’ and, when arrived within the district, in reply to my inquiries respecting Corrach Uachdar or D’oufllach, no one that I met with

had ever heard of such names, though I took great pains in making clear what ought to be its situation, and the way in which the names were spelled, not trusting to my pronunciation. Such being the case, I was obliged to trust to myself, and search diligently, and had the pleasure of discovering a locality for the said fern, which I suppose to be the third in which it has been found in Scotland. It is not Mr. Borrer's station, directions for which I have since received, but may be six to eight miles distant from it. I found one frond only in fruit. It is, indeed, a most delicate and beautiful fern. The rhizoma is creeping, as in *P. Dryopteris*. Habit:—stipes erect; the upper portion of the frond nearly horizontal, consequently it has somewhat of an elbow at the junction, though not so much as in *P. Dryopteris*; the ends of the pinnæ and frond are rather depressed, as far as I recollect. The figure in Newman's 'Ferns' is good, and represents a full-sized specimen. The stipes is generally half the total length of the frond; fronds from 2 to 6 inches in length, not rigid, of a delicate pale green; substance as delicate and fragile as *C. fragilis* grown in shady places. Habitat:—mountain ravines, on ledges of rock, in moist situations; rhizoma creeping among moss, and throwing up its fronds sparingly."—*Thomas Westcombe; August 22, 1853.*

Note on Pseudathyrium flexile.

"I have not met with this again, and suspect that it is quite of rare occurrence. I did not revisit the glen in which we found it; and if it should not be found in more places, I should be cautious of giving directions to its site. I think that it is quite distinct from *P. alpestre*; and if it had not been already brought forward as a distinct species, I should have done so. The two plants look quite different in cultivation. The frond of *P. flexile* is linear-lanceolate, with the pinnæ short and decidedly deflexed; it fruits in quite a small state, as compared with *P. alpestre*; indeed, I have never seen the latter in fruit, except in large, strong plants, in which case it bears a strong resemblance to *Athyrium Filix-fœmina*. I have a good-sized plant in my garden, but it shows no sign of fructification; whereas my *P. flexile*, though less than six inches in length, is in fruit. The latter is grown in pots, in a cold frame. I am not sure that we found both plants growing together, but I am inclined to think that we did. *P. alpestre* I found sparingly on Benlawers, abundantly in Canlochen and Glen Callater. I have roots from these three places. I observed very little in fructification; in fact, none worth preserving, under the circumstance of my press being nearly full."—*Id.*

Trifolium patens near *Ashby-de-la-Zouch*.

"I send you a specimen of *Trifolium patens*, *Schreber*, which my friend Coleman lately discovered, growing on the embankment of the Burton and Leicester Railway, near Ashby-de-la-Zouch. It has probably been introduced with seeds from abroad, about four years ago, when the embankment was made. A quantity of *Crepis setosa* was growing near it, and also on other parts of the embankment, some distance from the spot; but there was only one rather large patch of *T. patens*. It is, I believe, a denizen of Germany, and other parts of Europe."—*Andrew Bloxam; Twycross, Atherstone, August 25, 1853.*

Adiantum Capillus-Veneris near *Bath*.

"I found three plants of this fern, growing in the air-shaft of a stone-quarry, some thirty feet below the ground, at Combdown, near Bath. Master Millett has also found another Cornish locality, about two miles from the well-known one at St. Ives. My plants of this fern, grown in pots, surprise most botanists, from their attaining a very large size, some fronds being a foot long. They are grown in a very rich soil, having plenty of leaf-mould, and the pots kept in a cool greenhouse. A plant has kept alive for three years, in our fernery, without protection."—*E. J. Lowe; Observatory, Beeston, near Nottingham.*

Fungus in the Heart of an Oak-tree.

"The very day that I had been reading Prof. Quekett's account of a fungus in the heart of a living oak (*Phytol.* iv. 945), I happened to be superintending some bark-peelers; when my attention was directed to an oak, which was partially decayed at the centre, towards the root, and the decayed wood mottled all over with patches of a white fungus. The tree was quite sound all round the circumference, and exhibited no marks of decay externally; and I had no suspicion of its being faulty, when I marked it for falling. Here there is another instance of a fungus in the heart of a living oak, which, Prof. Quekett thinks, has never before been recorded. I enclose a specimen."—*W. T. Bree; Allesley Rectory, Coventry.*

Udora Canadensis at *Stafford*.

"This interesting but unwelcome stranger has found its way here, within the last two years. The men who have charge of the river first observed it last year; and now it forms huge banks of vegetation in

the river, below the town, where it seems likely to become as great a nuisance as it is in Cambridgeshire. Its habitats are thus advanced from the Derbyshire border, at Burton-upon-Trent, to the centre of the county. Our dirty little stream (aptly named the Sow) flows into the Trent; so that the two localities have a very direct water-communication with each other. How it was introduced here, I cannot ascertain. Its existence so near home was unknown to me until yesterday, when, taking a botanical stroll with a friend, this remarkable addition to our local Flora came under our observation."—*R. C. Douglas, M.A. ; Forebridge, Stafford, August 23, 1853.*

Udora Canadensis in the Valley of the Severn.

"While taking a botanical stroll, yesterday evening, I found a small patch of *Udora Canadensis*, in a pool near the river Severn, but unconnected with it, except by floods, near Bevere Island, about three miles from Worcester, up the river. I believe this is the first time it has been found in this *district*, though it was discovered in this *county*, in the Avon, at Evesham, in June last, by Mr. W. Chesshire."—*Thomas Baxter.*

Lastrea rigida near Bath.

"I beg to enclose a frond of what I believe to be the true *Lastrea rigida*. I found a single plant, bearing only four fronds, in a somewhat bleak and exposed situation, within a few miles of Bath. I searched diligently for other plants, but without success."—*John E. Vize ; Town Mills, Bath, September 19, 1853.*

The President, without hesitation, pronounced the frond which was exhibited to be *Lastrea rigida*, and in no way distinguishable from the same plant as found near Settle, in Yorkshire.

WORCESTERSHIRE NATURALISTS' FIELD CLUB.

Meeting in Wyre Forest.

A meeting of this Club took place in the latter part of August, within the shady coverts of Wyre Forest, under the Presidency of the Rev. Canon Cradock. "Stately Wyre" has been celebrated in the strains of Michael Drayton, and its venerated *sorb-tree* is noticed in the 'Philosophical Transactions,' for 1678. The party were anxious to examine the old *Pyrus domestica*, or true service-tree, the only one

known of the species, apparently wild, in any part of Britain. It is full a mile within the forest, and surrounded with dense underwood. Thin and decrepid, quite bare of foliage below, it now extends its lank arms a considerable height in air, and is only verdant at the extremities of these lofty branches. In fact, it is in the last stage of decay, and a few more years will probably leave it a mere weather-battered trunk. Only this single tree of the *Pyrus domestica* has at any time been found within the forest precincts, and how it got there is unknown; but, as it is probable there would have been others, if it had been indigenous at the spot, the inference would seem to be that it was brought from abroad. Mr. Lees at this time pointed out a mound of broken stones and débris, now overgrown with brambles, not far from the tree, which seemed like the ruins of an old dwelling, and suggested that an hermitage might have been formerly there, and the tree brought from Aquitaine, by some recluse in the time of Edward III., when the English, under the Black Prince, occupied that duchy. There was an undoubted feeling of superstitious protection attached to the tree, whose fruit was commonly said, by the foresters living in the vicinity, "to keep out the witch" from their habitations; and for this reason they hung up the hard fruit, which would remain a long time without decaying, in their houses. The tree is commonly called by the foresters the *Whitty*, or *Witten*, pear; perhaps derived from the old English word *witten*, to know, meaning the *wise tree*. They distinguish it from the mountain ash, which they simply call *Witchen*; and though a protective power is attributed to a stick of that tree, yet the "Whitty pear," they say, is "stronger." So, in the 'Arabian Nights,' the Genius of the Lamp was more powerful than the Genius of the Ring.

From the worn-out "service-tree," the party progressed on, among undulated oaken copses and watered ravines, to the brown horrors of sylvan shades, where the dense underwood spread a cloak, repulsive to observation; but here and there an opening space exhibited an old charcoal-heap, characterized by a peculiar vegetation, which Nature ever provides for secluded spots. Here was the *Marchantia polymorpha*, with its remarkable umbrella-like receptacles, spreading out like stars (both barren and fertile); brilliant scarlet patches of the local fungus, *Thelephora carbonaria*, contrasting so well with the blackened soil; and the hygrometrical moss (*Funaria hygrometica*), always following the track of fire along the charred ground. Still proceeding through mazes of gorse and bilberry-thickets, a great bog was entered upon, embowered and completely surrounded by thick

umbrage, where nothing could be seen but continuous forest, clothing hill and dale. A pretty scene was presented at this bog of undulating banks, covered with soft, yielding Sphagnum, with water gushing into every hollow, the whole profusely clothed with the tall *Eriophorum latifolium*, dangling its glossy tassels, white as ermine, with here and there the purple-flowered *Epipactis palustris*, and the fragrant *Gymnadenia conopsea*. A good deal of *Molinia cærulea* grew here, with fine purple spikes of flowers, and the borders of the bog were adorned with numerous bushes of *Rhamnus Frangula*, exhibiting a profusion of rose-coloured and black berries. About this spot, the silver-washed and dark green Fritillary butterflies (*Argynnis Paphia* and *A. Aglaia*) were observed, adding to the beauty of the scene. Here, also, *Carex pulicaris* and *C. fulva* were gathered.

The banks of Dowles Brook, now shaggy with flowering ling, were next traversed; and in the further progress to Park Brook, amidst glades filled with the bright *Erica cinerea*, profusely covered with purple bells, some beautiful, though secluded, sylvan features came into view. Here the party for some distance were obliged to proceed in Indian trail, from the close and dense investiture of verdure; but the fatigue was repaid on arriving at Park Brook, which, wandering at its own free will down a deep ravine, exhibits many most enchanting glimpses of rock, wood, and waterfall, charming to the lover of Nature, though on a confined scale. This gloomy and damp part of the forest has many charms for the botanical wanderer; and on the present occasion there were gathered the columbine and wood geranium, the elegant *Pyrolas* (*P. media* and *P. minor*), *Gentiana campestris*, *Gnaphalium sylvaticum*, *Hypericum dubium*, *Convallaria majalis*, *Hieracium umbellatum*, *Sanguisorba officinalis*, *Listera Nidus-avis*, and the pretty *Melica nutans*, in abundance. Among brambles, the less common ones were *R. Guntheri*, *R. hirtus*, and a variety of *R. Lejeunii*, as well as *R. saxatilis*. One traverse was made, across Dowles Brook, into Shropshire; for Mr. Jordan, of Bewdley, had remarked, that although *Geranium sanguineum* was plentiful on the Shropshire side of the brook, it never had the civility to step over into Worcestershire, much as he wished it. Close to the mouth of Dowles Brook, the water ouzel (*Cinclus aquaticus*) was started, which is a rare bird in Worcestershire; and here, on the banks of the Severn, *Spiræa salicifolia* and the beautiful *Coronilla varia* were observed to be growing luxuriantly, but certainly in a naturalized state. Mr. Jordan said the *Spiræa* had been there a great many years. Dowles Church was passed on the way to Bewdley, and *Ceterach officinarum*

noticed on its brick walls. The Club dined at the 'George' Hotel; where, afterwards, various remarks were made in reference to the country examined and the objects seen, by the Rev. Canon Cradock, Mr. E. Lees, V.P., and Mr. W. Mathews. Mr. Baxter exhibited specimens of *Udora Canadensis*, now first found in Worcestershire, gathered by him a few days previously in a marshy pond at Grimley. Mr. Lees inferred that it must have been brought down the Severn by the autumn or spring flood, as his friend, the Rev. Andrew Bloxam, had seen it growing in the Severn, at Shrewsbury, in the present spring. That the plant was carried through the country by inundations, Mr. Lees said was quite clear; for during the late flood on the river Avon, in July last, while the hay was floating on the water at Evesham, Mr. W. Cheshire, jun., of Stratford, who happened to be there, took up a quantity with a fork, and, floating under the hay, appeared numerous stems of the *Udora*, which had thus been carried along by the impetus of the hay coming in contact with it. The *Udora* would now, doubtless, soon be common both in Worcestershire and Gloucestershire. The party returned to Kidderminster and Worcester, after a long, but most delightful, day.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Sulphide of Calcium as a Remedy for the Grape Disease.

A paper by Dr. Astley P. Price, 'On the Employment of the higher Sulphides of Calcium as a Means of Preventing and Destroying the *Oidium Tuckeri*, or Grape Disease,' was read.

"Of the many substances which have been employed to arrest the devastating effects of this disease, none appear to have been so pre-eminently successful as sulphur, whether employed in the state of powder or flowers of sulphur, or by sublimation in houses so affected. Notwithstanding the several methods described for its application to the vines, I am not aware that any had been offered in 1851, when these experiments were instituted, by which sulphur might be uniformly distributed over the branches, and be there deposited in such a manner as to be to some extent firmly attached to the vine. Three houses at Margate, in the vicinity of the one in which the disease first made its appearance in England, having been for the space of five years infected with the disease, and notwithstanding the employment of sulphur as powdered and flowers of sulphur, no abatement in its

ravages could be discovered,—I was induced to employ a solution of pentasulphide of calcium, a solution of which having been found to act in no way injuriously to the young and delicate shoots of several plants, was applied to the juices in a dilute condition ; the object in view being that the compound should be decomposed by carbonic acid, and that the excess of sulphur should be deposited with the carbonate of lime in a uniform and durable covering on the stems and branches of the vines. This was adopted, and although but few applications were made, the stems became coated with a deposit of sulphur, and the disease gradually but effectually diminished, in so much that the houses are now entirely free from any trace of disease or symptoms of infection. The young shoots are in no way injured by its application, and the older wood covered with this deposit of sulphur continues exceedingly healthy. This was, we believe, the first employment of the higher sulphides of calcium as a vehicle for the application of sulphur to the stems and foliage of diseased vines. Specimens were exhibited from vines which in 1851 were covered with disease, and which have since the autumn of that year received no further treatment. The vines in the immediate neighbourhood, and adjoining one of the houses, are covered with the disease, but, notwithstanding their close proximity, no indication of the disease has at present been detected in either of the three houses."

Effect of Sulphate Lime upon Vegetable Substances.

A paper by Chevalier Claussen, 'On the Effect of Sulphate of Lime upon Vegetable Substances,' was read.

"About six weeks since I was engaged in making various experiments on the effect of sulphate of lime upon vegetable substances. A portion of the substances then used by me was thrown carelessly aside, and upon returning to my experiments about a fortnight afterwards, I was surprised to find that decomposition had not taken place in those portions of the vegetables which had been subjected to the action of the sulphate, while those which had not been so treated were completely decayed. Among the articles experimented upon were a number of potatoes, each of which was affected by the prevalent disease ; some of these remain sound to the present day, the others have some time since completely rotted away. Subsequently, I procured some more potatoes, and also some beet-roots, the former being, as far as I could judge, all diseased. I divided the potatoes into three portions. One lot I placed in a vessel with a weak solution of sulphuric acid, and from thence I placed them in a solution of

weak lime-water. In the second lot the process was reversed, that is to say, the potatoes were first placed in the lime-water, and then in the acid. The third lot was left untouched. Ten days afterwards I examined the potatoes, and found, as I expected, that the potatoes which had not been treated with the sulphate were rapidly decaying,—those which had been first placed in the solution of lime and then in the acid were more nearly decomposed,—while those which had been treated in the mode first described remained as sound as when first taken in hand. Upon being cut open the diseased part of the potatoes was not found to have spread internally, and the flavour of the root was in no degree affected by the application of the process, nor do I think that its germinating power was injured by the effect of the sulphate. The effect upon the beet-roots was similar to that produced upon the potatoes, and which would seem to be somewhat analogous to that of galvanizing metals, *viz.*, protecting the substances from the effect of atmospheric agencies. I may add, that muriatic and other acids have been employed by me on other occasions with equal success, the only agents required appearing to be those which will most readily produce a sulphate in contact with the substances required to be preserved. As at present it does not appear that any means can be successfully adopted to prevent the potato from becoming diseased while in the ground and arriving at maturity, it would certainly be of immense advantage if anything could be discovered by the use of which the roots when taken up could be prevented from that absolute decay and irreparable loss to which potatoes affected by the disease are liable. The results which I have described seem to me to point to the possibility of arresting this loss. How far the plan suggested may be practicable or applicable upon a large scale, my present very pressing and numerous engagements have hitherto prevented me from ascertaining. I do not think that any insuperable difficulty exists with respect to the application of the process. The acid employed by me was very weak, about one part to two hundred of water; the lime-water was about the consistency of milk. The materials are not, therefore, expensive; and when the value of the crop to be saved is taken into consideration, it would be a matter well worthy of being tested by some of those extensive growers of potatoes in the county in which the British Association is now holding its sittings. For my own part, I should be most happy if by any suggestion of mine I had merely been the instrument of directing the attention of scientific men to the subject of the possibility of preserving from total destruction a vegetable so valuable and so indispensable as the potato."

Utricular Structure of the Endochrome in a Species of Conferva.

A paper by Prof. Allman, 'On the Utricular Structure of the Endochrome in a Species of Conferva,' was read.

The plant which constituted the subject of the communication, is closely allied to *Conferva Linum*, and the author showed that the deep green endochrome, when liberated from the cell, is seen to possess a very definite utricular structure. Each utricle is filled with homogeneous green matter, which surrounds one or more peculiarly formed starch granules. In many instances, urticles were met with of a large size, and filled with a brood of secondary urticles, each containing homogeneous green contents, surrounding a nucleus-like starch granule.

A long discussion followed the reading of this paper—which ultimately turned upon the distinctions existing between the animal and the vegetable kingdoms.

Dr. Redfern dwelt on the importance of recognizing the function of cell contents, as well as of cell-walls. Physiologists were too prone to recognize the cell-wall, to the exclusion of what it contained.

Dr. Walker-Arnott stated that he had recently heard that starch had been found in the *Medusæ*. If this were the case, the existence of starch could be no longer claimed as characteristic of the vegetable kingdom.

Prof. Allman agreed with Dr. Lankester that the best expression to be found for animal and vegetable life at present was, the general fact of vegetable tissue giving off oxygen gas, and absorbing carbonic acid, whilst animal tissue absorbed oxygen and gave off carbonic acid.

Diatomaceæ found in the Vicinity of Hull.

Mr. J. D. Sollitt read a paper, prepared by himself, in conjunction with Mr. R. Harrison, 'On the Diatomaceæ found in the Vicinity of Hull,' showing that the freshwater and marine Diatomaceæ were exceedingly numerous in this locality; the beauty of the varied forms of which were such as to delight the microscopist, and, at the same time, some of them are highly useful as forming that class of *test objects* for microscopes which are the best calculated of all others for determining the excellence and powers of object glasses. As test objects they were first discovered by the Hull microscopists,—and have now been adopted as such by all the microscopists not only in this but in all other countries. Mr. Harrison and Mr. Sollitt discovered the markings on those delicate siliceous coverings as early as 1841. It was shown that the markings on those shells were so fine as to range between 34,000 to 130,000 to the inch; the *Plurosigma*

strigilis being the strongest marked, and the *Navicula Acus* the finest. It was afterwards pointed out that a large bed of fossil freshwater *Diatomaceæ*, of at least two feet in thickness, had been discovered in Holderness,—and that in a submerged forest on the coast of Holderness numbers of fossil freshwater *Diatomaceæ* had been discovered, although the sea flows over the part at every tide. The paper concluded by pointing out that upwards of 150 species of marine and freshwater *Diatomaceæ* had been identified in the neighbourhood of Hull.

The reading of this paper was followed by a long discussion. First, in relation to the microscopic powers and the structure of the instruments employed by the Hull observers. Secondly, with regard to the nature of the lines found on the surface of the *Diatomaceæ*. Thirdly, on the question of the vegetable or animal nature of the *Diatomaceæ*. From the statement of Mr. Sollitt and Mr. Harrison, it appeared that the lenses which they had employed for the minuter markings were object-glasses of Nacet's manufacture, the one-sixteenth and the one-eighth of an inch focal distance, with angles of aperture of 115° and 105° diameter, and for the larger markings one-fourth of Smith's, with an aperture of 46° . With these glasses they had detected markings whose interspaces numbered 130,000 to the inch. Mr. Sollitt regarded the lines as consisting of rows of minute tubercles, which gave the appearance of continuous lines.

Dr. Walker-Arnott considered that these curious beings must now be regarded as plants.

Prof. Allman looked upon them as the starting-point of Nature in which the mineral, animal, and vegetable laws of creation were struggling for ascendancy.

Mr. Sollitt and Mr. Harrison regarded them as animals, and quoted the opinion of Prof. Bailey of New York.

Prof. Balfour referred to their resemblance to *Desmideæ*, and the conjugation observed amongst them as conclusive proofs of their relation to the *Confervæ*, whose vegetable nature no one doubted.

Dr. Lankester referred to Schleiden's objection, of their possessing a highly complicated structure, and pointed out their resemblance to the *Foraminifera*, which all agreed to be animals. It had, however, been asserted that the *Diatomaceæ* possessed starch, and as yet this had not been discovered as a secreted product in beings recognized as truly animals, whilst starch was universally present in true vegetable productions.

Botanical Notes and Observations on Plants observed in Essex, during the year 1852. By E. G. VARENNE, Esq.

Ranunculus cœnosus, Guss. On the margins of a moat at Great Totham.

Barbarea vulgaris, L. This common weed is marked "perennial" by Smith, and Hooker & Arnott; and "biennial?" by Babington. It is most probable that the former writers are correct in their idea of the duration of *B. vulgaris*, from the fact of the withered stems of the previous year being commonly found attached to the root of the growing stems of the plant, in spring and early summer.

Three varieties of *Barbarea vulgaris* are found in this part of the county of Essex :—

1. The common form of descriptive writers.
2. An arcuate form, which grows with a large top, on very damp banks by the brook-side at Rivenhall.
3. A form bearing a close resemblance to, if it be not identical with, *Barbarea stricta*, Andr., and which is only to be found on very dry banks.

Hypericum perforatum, L. There are two distinct varieties of this species to be found about Kelvedon. These varieties are distinguishable by the form and size of the segments of the calyx.

1. The first variety is the ordinary form of the species, in which the sepals are erect, lanceolate and acute, imparting a very bristly appearance to the young flower-buds. The foliage of this first variety is of a peculiar light green, and it varies with narrow oblong and broader oblong leaves.
2. In the second variety, the sepals are half the length of those of the ordinary form, and broader. They are ovate, lanceolate, mucronate, and impart a very blunt appearance to the young flower-buds. They are distinctly reflexed in the early condition of the flower; and when the fruit is well developed the ends of the sepals retain the reflexed character. The foliage of the plants belonging to this variety is of a dark green colour above, very glaucous beneath; and the veins of the leaves being more distant, the intervening reticulations cause them to present a more pellucid appearance than is to be met with in those of the ordinary form. The form and shape of the leaves vary in this, as they do in those of the first variety. In the larger-leaved plants, moreover, the leaves assume an

obovate form. Indeed, there is reason to believe that the plants of this second variety are sometimes named *Hypericum maculatum* by botanists ; and I once met with a good specimen of it intermixed with a number of specimens of *H. dubium*, which were sent to me by a botanical friend. This fact is mentioned for the purpose of indicating the strong resemblance a certain form of *H. perforatum* bears to *H. dubium*. The second variety of *Hypericum perforatum* is a permanent one, and has remained constant to its characters, in very many situations, for several years. It may be presumed that the range of its localities is not very limited, as it appears to have attracted the notice of the late Dr. Bromfield in Hampshire, and is mentioned by him in the 'Phytologist' (iii. 272).

Melilotus arvensis, Wallr. Clover-field, Kelvedon.

Melilotus vulgaris, Wallr. Clover-field, Kelvedon.

Trifolium elegans, Savi. Has maintained its position for some years about the sides of certain hilly fields of corn-land at Great Braxted ; but to the history of its introduction no clew can be obtained.

Epilobium roseum, L. "Scions none," *Hook. & Arnott* ; "scions wanting," *Babington*. On the Kelvedon plants of this species, short scions, terminated by a rosette, are found in the autumn. Scions are also denied to *Epilobium montanum*, L., by the same authors ; but, nevertheless, long suckers are to be found attached to the lowermost underground joints of the stem ? of that species. In their young condition, these suckers are faithfully delineated by the artist in 'English Botany,' plate 1177 ; and Smith says of the root of *Epilobium montanum*, L. ('English Flora,' vol. ii. p. 214), that it has "red shoots."

Helminthia echioides, Gærtner, "Annual," *Smith and Babington* ; "perennial," *Hook. & Arnott*. This plant might well appear to be only of a biennial character, to a person who had merely observed its autumnal tuft of leaves, succeeded by stem and flowers in the ensuing year. And to such an extent I was, for some time, accustomed to view its duration. But, in reference to the perennial character ascribed to *Helminthia echioides* by Hooker & Arnott, I must remark that I believe those writers to be correct in extending the duration of the plant from the biennial to the perennial character ; for I have seen young and vigorous stems of *H. echioides*, growing in lately cleared woods, side by side with the decayed stems of the past year.

The apparent preference for viatical situations, on the part of *H. echioides*, appears to arise from the fact, that in such situations the growth of the plant is not interfered with in the early stages. Indeed, were it not for the proceedings of husbandry, *H. echioides* would be a much more common plant than it is now on the stronger soils of this county; for, as it first throws out its leaves in the autumnal period of the year, it is liable to be destroyed in our fields, by the agricultural operations then going on. The finest specimens of this not inelegant weed I ever met with, and they were numerous enough, were in a field of cole-wort left for seed. Here the young plants of the bristly ox-tongue were not cut up in the autumn; and when full-grown they were equally secure from destruction, because their eradication would have caused more damage to the crop than was incurred by allowing them to remain.

Cuscuta Hassiaca, Pf. In a field of lucerne at Rawreth; just coming into flower on the 1st of September, 1852.

Marrubium vulgare, L. Has extended itself, during the last two or three years, over some parts of the remains of Old Tiptree Heath, and is particularly abundant on a bank of newly enclosed land. It would not be right to leave unnoticed the fact, that the horehound had long been growing in some cottage garden-ground close to the new banks; but in other parts of the Heath, where solitary plants of *Marrubium vulgare* are occasionally to be found, no gardens containing the horehound exist.

Chenopodium album, L. The large, green-looking weeds that are found growing on dung-heaps, and in rich ground, and which are known by the above name, cannot be the exact type of the species which Linneus had in view when he adopted the concise definition of Tournefort, "*Chenopodium folio sinuato candicante*," as expressive of the character of this common plant. In the neighbourhood of Kelvedon, the specimens of *Chenopodium album*, corresponding with the definition of Tournefort, and agreeing in appearance and character with specimens in the Linnean herbarium (as I am politely informed by Mr. Watson), are to be found, in a scattered as well as in a gregarious manner, in the sides and corners of corn-fields, among wheat, barley, oats, and beans. In such situations, but most particularly on light soils, they are to be met with all over the eastern portion of the county of Essex. They are also occasionally found growing in gravel-pits, and on gravelly banks, and are then often accompanied by the more robust green-leaved form of the species, and by the variety known as *Chenopodium viride*.

When young, the typical form of *Chenopodium album* presents a very pale green colour of the stem and foliage, which pale green colour passes into various shades of red and white, as the age of the plant increases. For instance, when the flowers are fully formed the margins of the leaves put on a roseate tint, which tint, as the fruit ripens, extends over more or less of the surface of the leaf. The perianth, at a still later period, becomes also of a similar roseate hue, or else a deep red colour is found diffused over it; and at the same time the stem is striated with white and green lines, harmoniously shaded off with pink. The stem is usually simple and upright, having but few leaves, and is terminated by short branches, which bear the panicles of fruit; so that the plant presents something of the aspect of small specimens of *Atriplex deltoidea*. In the more robust specimens, the panicles of inflorescence become elongated, having the terminal flower stalked and larger than the others, and the numerous lengthened fruit-bearing branches tower above the few leaves of the stem.

The form of the leaves is variable; but these organs are generally broad, in proportion to their length. The fugacious lowermost leaves are roundish ovate, rather triangular or deltoid at the base, irregularly sinuate-dentate at the margins, and rounded off at the end. The middle leaves are narrower than the lowermost, more rhomboid; some of them very acute at the apex, and very irregularly as well as deeply indented at the margins. The middle as well as the lower leaves are characterized by a distinct tendency to the three-lobed form. The uppermost leaves are lanceolate and entire, degenerating into bracteas at the base of the inflorescence. All the leaves are more or less glaucous and mealy beneath, when young.

The fruit is variable in size, and covered by a perianth, larger and more fully developed than is the same part in the luxuriant variety of rich soils. When the fruit is first formed, the filmy, white pericarp easily rubs off, and the exposed seed is black, shining, and very minutely striate-dotted. After a period, the transparent, easily removable pericarp of the early state of the fruit hardens, and becomes opaque, of a brown colour, and covered with whitish papillæ. It is very difficult to remove the hardened pericarp from the seed. In the well-formed and fully developed fruit, the lower portion is decidedly more convex than the upper, its shape being like that of a bun. The keel of the margin is variable, and not always present. After the process of fructification is perfected, the segments of the strongly keeled perianth separate, and expose the fruit. The gay appearance of the

stem and foliage, and the exposed mature fruit, are more or less characteristic of the typical *Chenopodium album*. In the dung-hill and green-leaved plants, the entire perianth appears to turn whitish brown, and dies off without exposing the fruit; which latter assumes the opaque, grayish appearance much later than the fruit of the rosy-leaved plants; and its pericarp, when hardened and dull, is more readily removed.

There is a variety of *Chenopodium album*, growing in garden-grounds, amongst potatoes and other vegetables, which presents various colours about the stem, and margins of the leaves, and is more particularly red or purplish about the base of the stem and branches. The plants of this form branch but little in the lower part, though they attain the height of three feet, or more. The upper part of these weeds is conspicuous at a distance, with long, leafless branches, bearing panicles of inflorescence; the whole plant in habit bearing a resemblance to *Artemisia vulgaris*: the abundant inflorescence attracting the attention, by its excess over the foliage, as in the last-named plant. The leaves of this variety correspond with those of the corn-field plants, excepting in size, and in the lower ones being distantly dotted on the upper surface with mealy points. The early condition of the fruit has the seed microscopically punctate; but I have had no opportunity of observing the fruit when fully ripe, because these larger things are, sooner or later, exterminated by the gardeners. The corn-field plants, on the contrary, are more secure from invasion, being protected by the respect shown to the crop under whose shadow they grow. Thus it is that they are allowed to remain undisturbed until the harvest operations begin, at which period their fruit is mostly perfected.

In the punctulation of the seed, and in the shape of the fruit, the typical *Chenopodium album* approaches *Chenopodium ficifolium*, with which latter plant I confess myself at first to have confounded it; but, independently of the difference of foliage, the fruit of *C. ficifolium* is much smaller than that of *C. album*. I am not able, at present, to affirm that all the forms of *Chenopodium album* have the seeds striated and minutely dotted, as are those of the typical form; but I nevertheless believe that the dots and markings are not so perceptible in the seeds of the dung-hill form of *C. album*; for although our descriptive writers have varied in their characters of the seed of *Chenopodium album*, none of them mention the seeds as being minutely punctulate.

The following extracts from the works of authors of best repute illustrate the discrepancy alluded to:—

“Seed perfectly even, not dotted.”—*Smith*, ‘English Flora,’ vol. ii. p. 13.

“Fruit smooth.”—*Hooker*, ‘British Flora,’ 1st ed. p. 277.

“Seeds smooth, shining, bluntly keeled at the edge.”—*Ibid.*, 6th ed. p. 245.

“Seeds depressed, smooth and shining, margins obtuse.”—*Leighton*, ‘Flora of Shropshire,’ p. 123.

“Seeds orbicular, depressed, smooth and shining, convex on both sides, obtusely but distinctly keeled on the margins.”—*Ibid.*, 515.

“Seeds horizontal, smooth and shining, obtusely keeled at the margin.”—*Babington*, ‘Manual,’ 3rd ed. p. 267.

I must crave the indulgence of the readers of the ‘Phytologist’ for trespassing thus prominently on their attention with the foregoing description of the typical form of *Chenopodium album*. Indeed, I am led to understand that this form of the species has puzzled some good botanists; and in these discriminating times one might have felt inclined to consider it as something specifically different from the form of *Chenopodium album* delineated in Smith’s plate. But cultivation soon settles the point, for the seeds of the small and roseate forms spring up into large, green-leaved plants, if sown in a suitable soil.

As they occur about Kelvedon, the varieties of *Chenopodium album* may be arranged as follows:—

1. The roseate, or typical form. *Chenopodium folio sinuato, candicante*.
2. The green-leaved, or dung-heap form of Smith’s plant.
3. The *Chenopodium viride*, *L.*
4. The form with lanceolate, entire leaves.
5. An autumnal form, occurring, unlike the others, on strong land; in leaves and inflorescence resembling *Chenopodium murale*. The seeds of this variety I have been unable to meet with. It seems an approximation to the *C. pedunculare* of Woods’ ‘Tourist’s Flora.’

I cannot conclude these observations on *Chenopodium album* without stating my obligations to Mr. Borrer, for allowing me to trouble him with my inquiries on the subject.

Chenopodium ficifolium, Sm. Turnip-field, Great Tey; dung-heap, Inworth.

Lolium italicum, Braun. Often occurs in the neighbourhood of Kelvedon, in the corners and sides of corn-fields, and amongst clover. It also grows in the meadows. Its introduction of late years amongst clover-seed, is very probable; but, if this grass be merely a variety of *Lolium perenne*, its growth in the meadows may admit of a different explanation.

E. G. VARENNE.

Kelvedon, September 26, 1853.

Notes on the Localities of certain Hampshire Plants, observed in August and September, 1853. By A. IRVINE, Esq.

OUR object in visiting Southampton and the Isle of Wight was not strictly botanical, but rather for the sake of relaxation and recreation: hence the number of species noted is not so numerous as they might have been if we had had this as our sole motive for undertaking the journey; but they are not therefore the less interesting. Every fact bearing on the Botany of a district which has been amply investigated by the late Dr. Bromfield and others, cannot fail of possessing an interest among all who love the science and desire its extension. The only plant of great interest about Southampton is *Spartina alterniflora*, which grows plentifully on both sides of the Itchin, both above and below Northam Bridge. The other species, *S. stricta*, is said to grow with the former; but we did not see it. On a rubbishy part of the shore, were gathered *Plantago pumila*? *Medicago denticulata*, and a few exotic Cruciferæ, which I have observed, for two years, growing with numbers of foreign plants, near the steam-boat pier at Wandsworth. This fact proves that several species not British are extending themselves, and probably, at some future period, will be ranked among the semi-naturalized denizens of the British Isles. On the shore of the Southampton Water, as it is called, there is a large patch of *Spartina alterniflora*, about half-way between Netley Abbey and Southampton. The only vegetation of the pebbly beach of this part of the estuary is *Glaucum corniculatum* [?], *Silene maritima*, and a very few commoner plants. *Aster Tripolium* grows in muddy parts, and in the adjoining ditches. In the ruins of Netley Abbey we noticed *Atropa Belladonna*, only one poor plant, neither in flower nor in fruit. On the roadside near the Abbey, returning by the heath to Itchin Ferry, *Dianthus Armeria* was found in considerable plenty. *Hypericum Androsæmum* and *H. calycinum* were also noticed near South-

ampton, but neither of them in places sufficiently remote from cultivation to warrant their being, here at least, considered indigenous.

About Carisbrooke Castle, near Newport, Isle of Wight, we gathered *Iris fœtida* [?], *Gentiana Amarella*, and, on the rampart wall, *Centranthus ruber*. On a ledge near the window of King Charles's apartment, pointed out to all visitors, there is a fine plant of *Lathyrus latifolius*, well established and very characteristic. In Parkhurst Forest, about two miles from Newport, there is a very luxuriant form of *Cnicus pratensis*, nearly two yards high, and bearing from three to four leaves. There is also a form of *Scutellaria minor*, from two to three feet high, very straggling in its growth, but agreeing sufficiently with the common form in every character, except habit and size, and not approaching to *S. galericulata*. The radiate form of *Centaurea nigra* is the rule here, as in all the western parts of the Island visited by me, where this plant grows; and the common form is the exception. About Freshwater there is a *Mentha*, not uncommon, which I took for *M. sylvestris*. A stalk of *Lavatera arborea*, with fruit on its branches, was found among the rejectamenta of the sea; also a few stalks of the sea stock (*Matthiolum maritimum*) [?]. The vegetation of the downs at Freshwater, and all along the coast by the Beacon, the Needles Lighthouse, Alum Bay, &c., is of a remarkably stunted nature. *Daucus Carota* was scarcely half an inch high; yet it bore an umbel of flowers. *Campanula glomerata* was rarely found above an inch high, and usually with a single flower. *Gentiana Amarella* was also invariably found with four segments both in the calyx and corolla, and those of the latter usually more rounded than in the common form of this plant. About Yarmouth, *Spartina stricta* is plentiful, both on the Yar and in a salt-marsh going towards Sconce Point. On the sandy beach which separates the sea from this marsh, *Eryngo maritima* [?] was very fine and plentiful; also *Psamma arenaria*, *Convolvulus Soldanella* (only in leaf), *Asparagus officinalis*, *Fœniculum vulgare* (the former plentiful, the latter very sparingly), *Cakile maritima*, and a few other less interesting species. On the downs above Sconce Point was observed *Spiranthes autumnalis*, very sparingly. This plant is eaten off by the sheep; on the cow-pasture, it was not so scarce along the coast. *Erythræa pulchella*, a very dwarf form, was not scarce; *Hyoscyamus niger*, where the fort is building. About Yarmouth, *Borago officinalis* is plentiful in a lane, both on the bank and in the ditch (a dry one); also *Lycium barbarum*, what is vulgarly called the "tea-plant" about London. In the gardens grew, as a weed,

Linaria purpurea; also a *Coronilla*. Although the temperature of Yarmouth appeared (felt) to us lower than that of London by several degrees, yet the growth of certain plants in the open air, or only slightly protected, shows that the annual temperature is higher than that of London. Fuchsias of immense size were quite common in almost every garden, as were also Hydrangeas and myrtles, both flowering beautifully. We noticed *Aloysia citriodora*, the lemon-scented *Verbena*, as it is commonly called, not much less than twenty feet high, and of a moderate thickness: this plant was supported by a wall. On the road from Yarmouth Ferry to Freshwater, *Hypericum calycinum* was noticed in a copse, along with plenty of *Rubia peregrina*. The latter plant is common in the hedges on the west side of the Yar. *Iris foetida* [?] abounds between Yarmouth and Newtown; and on the coast in the same direction large specimens of *Erythræa pulchella* occur, some of them not less than from eighteen inches to two feet high, with branches nearly as long. Here, also, *Spiranthes autumnalis* occurs; *i. e.*, in almost all pastures, excepting those depastured by sheep.

ALEXANDER IRVINE.

October, 1853.

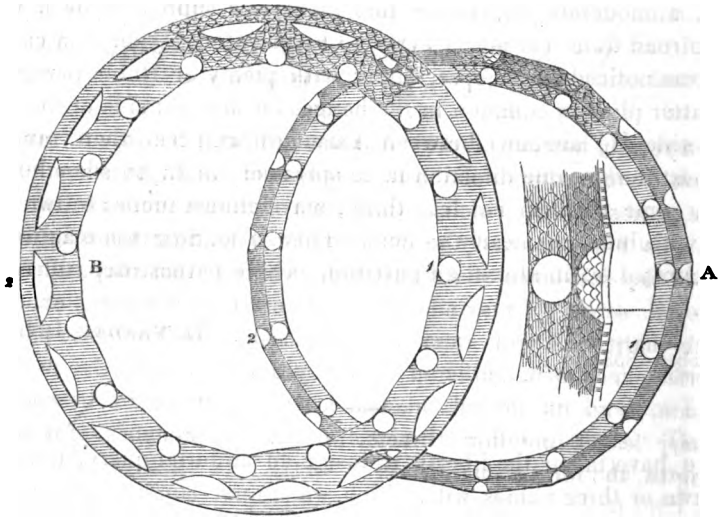
[We have taken the liberty to insert an editorial query, thus [?], after two or three names with which we are not familiar in their present form.—*Ed.*]

On the Contrast afforded by the internal Structure of the Stems of Equisetum limosum and E. fluviatile. By J. G. BAKER, Esq.

SINCE sending my former observations upon the *Equiseta*, I have been favoured with an illustrated report of a carefully conducted microscopical investigation into the anatomical structure of these plants, kindly undertaken, for the purpose of confirming or disproving their distinctness as species, by R. Etheridge, Esq., Curator of the Bristol Institution.

I am sending herewith, for publication, the drawings supplied by that gentlemen, so that the means of forming a decision respecting this question will be equally open to all; and further comment than a brief abstract of his notes upon the leading points of contrast will be rendered superfluous.

In both of the supposed species, the stem consists of a hollow tube, the central cavity of which many times exceeds in diameter the solid portion; in which respect they differ conspicuously from all the other species. The siliceous cuticle in both is identical: in the exposed portions of each it is equally penetrated by stomata, which are necessarily absent from its submerged parts. The solid portion of the stem in both consists of regular, well-defined, hexagonal cells.



A.—Transverse section of the stem of *E. limosum*, magnified. 1. Hollow tubes; 2. Triangular system of delicate hexagonal cells.

B.—Transverse section of the stem of *E. fluviatile*, magnified as in A. 1. Inner row of circular tubes; 2. Outer row of plano-convex tubes.

In *E. fluviatile* it is about twice as thick as in *E. limosum*, and is penetrated by *two* series of tubes, equalling in number the external striæ. The inner row of these, which apparently contain the delicate spiral vessels and annular ducts, are circular in shape, and placed close to the central cavity. Behind these, but at a considerable space from the epidermis, alternate the second row of tubes, which are plano-convex or elliptical in shape; the major axis being double the length of the minor.

The solid portion of the stem of *E. limosum* is only about half as thick as that of *E. fluviatile*, and is consequently much less succulent. It is penetrated by only a *single* row of tubes, which, in their organization and position, resemble the inner row in *E. fluviatile*. The epidermis opposite these is depressed, and bears a system of

hexagonal cells, much more delicate in their texture than the surrounding tissue. This body of cells is invariably somewhat triangular in shape, the apex of the triangle being placed against the hollow tube. These differences will be more clearly perceived by the aid of the accompanying figures.

JOHN G. BAKER.

Thirsk, August 11, 1853.

Note on Pyrola rotundifolia, var. arenaria.

By D. OLIVER, JUN., Esq., F.L.S.

IN a recent number of the 'Annales des Sciences,' there occurs a note on *Pyrola rotundifolia*, var. *arenaria* of Koch, by Planchon; a notice or abstract of which, I think, may interest those British botanists who have not had the opportunity of reading the original. I subjoin the substance of a translation, which I trust may sufficiently convey its sense. I may add, that I do not myself possess examples of this maritime *Pyrola* from either Lancashire or Yorkshire; but an imperfect specimen, gathered a few years ago, near Castle Eden, Durham, from its several bracteal leaves, intermediate between the ordinary leaves and floral bracts, probably approaches, if it do not belong to, the form *arenaria*.

About six or seven years ago, Sir W. J. Hooker received from some correspondent a *Pyrola*, gathered on the Yorkshire coast, and since found on the shores of Lancashire by Kenyon (see *Bab. Man.* 2nd ed.) An examination of very numerous fresh specimens, and a careful comparison of these with the *Pyrola rotundifolia* of Europe and N. America, discovered several deviations from the latter type. Their smaller proportions; the less and more shortly petiolate leaves; their flowers but about half the size; the shorter calycine segments, sometimes approaching an oval instead of a linear outline; but more especially the numerous bracts *upon the stem*, in this plant always numbering four, five, or six of these organs, while in *P. rotundifolia* but two bracts are normal; remove the Yorkshire *Pyrola* from the type *rotundifolia*. Although this latter character was not expressly noted by Koch (*Syn. Fl. Germ.*) of the variety of round-leaved *Pyrola* which he called *arenaria*, yet the agreement of other structural points led him (Dr. P.), from the first, to presume the identity of the English plant with that of the German Flora.

This latter plant, however, remained unknown, excepting by a brief diagnosis, until Buchinger communicated to the herbarium of Loyer Villemet well-authenticated examples of this plant, gathered by Bœckler, in Norderney. A comparison of these specimens with those of our Yorkshire *Pyrola*, abundantly confirmed the previously presumed identity of the two; but it has at the same time, he says, modified his ideas as to the specific value of each of them, in proving to us that the unusual number of bracts, always constant in the English plant, is sometimes reduced to two, as in the normal type. This proved, the type *rotundifolia* seems, from actual observation, sufficient to include as a variety this form *arenaria*, which Planchon has long regarded as a species.

The object of this notice was merely to direct the attention of botanists to a remarkable form, which will be found, no doubt, on various shores of temperate Europe. Moreover, it is desirable carefully to follow through its possible variations a species which we find not only over Europe, but also in Siberia, and even, it may be, in the pine-forests of Mexico.

In conclusion, he adds that the *P. rotundifolia* of Gouan (*Flora Monsp.*), which grows in the Cevennes, with *P. secunda*, *P. minor*, and *P. uniflora*, is no other than the *P. chlorantha* of Swartz,—an opinion already established by the authors of the '*Nouvelle Flore de France*,' but without any mention of Gouan's synonyme.

DANIEL OLIVER, JUN.

Newcastle, October 10, 1853.

NOTICES OF NEW BOOKS, &c.

'*Terra Lindisfarnensis. The Natural History of the Eastern Borders.* By GEORGE JOHNSTON, M.D. Edin.; LL.D. of Marischal College, Aberdeen; Fellow of the Royal College of Surgeons of Edinburgh; &c. Vol. I. The Botany. London: Van Voorst. 1853. Price 10s. 6d.'

(Concluded from page 1090).

Gardiner, '*Flora of Forfarshire*,' p. 44, and several of our Scottish correspondents, appear to confound the furze and the broom, as far

as the celebrated and somewhat hackneyed anecdote of Linnean worship is concerned. Gardiner tells us that one of the dearest associations awakened in the mind by beholding the broom in flower, "is the remembrance that the gorgeous luxuriance of its golden blossoms so enraptured the illustrious Linneus when he first beheld it in profusion on his first visit to England, that he fell down upon his knees in an ecstasy of pleasure to enjoy such a glorious sight." The anecdote applies to the furze, and the delight of Linneus was occasioned by the beauty of the plant, amid the inclement eastern blasts of early spring, and would not apply to the broom, which flowers so much later. Dr. Johnston omits the story altogether, and gives us information about the broom far more acceptable.

"*Spartium scoparium* = *Sarothamnus scoparius*. The Broom. May, June. There are several places in Berwickshire the names of which indicate the former prevalence of this beautiful shrub in their localities; *e. g.*, Broomhouses, Broomilaw, Broomhill, Broomdykes, and Broomknowes;—but its habitat of greatest celebrity is Cowdenknowes, an undulatory rising ground of great beauty in the West of the county:—

‘ More pleasant far to me the broom
So fair on Cowdenknowes,
For sure so sweet, so soft a bloom,
Elsewhere there never grows.’

The progress of agriculture has greatly thinned and depauperated our broomie shaws, but still the ‘lang yellow broom’ is plentiful enough in many of our deans, and on many a steep brae, in upland districts especially. It is, says Sir Thomas Dick Lauder, ‘a curious fact in regard to the history of the plant, that it grows to perfection in a very few years, some seven or eight, we believe, and then dies entirely away, and then some years must generally elapse before the seed, with which the ground must necessarily have been filled, will vegetate: of this we have ourselves had large experience.’ ‘Tait’s Magazine,’ Oct. 1847, p. 657.—Sheep are very fond of the broom, and they may be pastured upon it and whins, in favourable situations, during winter, as an intelligent farmer, on the border of the Lammermuirs, informed me, he had often done with profit and advantage. The sheep invariably first pick off, and greedily devour, the pods, which produce a sort of intoxication, but this effect is transient, and leaves no inconvenience behind. ‘*Spartium scoparium si ovis ingurgitit, statim temulenta evadit, decumbit, et pro tempore ambulare nequit. Hæc affectio autem usui continuo plantæ cedit.*’ Rev. Dr. Walker.

It exerts a like intoxicating influence on man, and hence Allan Ramsey, in his address to a landlady who was famous for brewing a heady ale, tells us—

‘Some said it was the pith of broom
That she stow’d in her masking loom,
Which in our heads rais’d sic a soom ;
Or some wild seed,
Which aft the chaping stoup did toom,
But fill’d our head.’—*Poems*, i, p. 219.

An infusion or decoction of the young shoots is a popular, and not inefficient remedy in many dropsical cases. Besoms are called in the North, brooms, having, until of late years, been commonly made of the twigs of this shrub. In 1554, before the Bailiff’s court, a jury of twelve men found ‘that the yonge brome of this towne (Berwick) ought not to be cut, for it is a comodyte to this towne.’”—P. 51.

The observations which follow, respecting *Pyrola minor*, are singularly corroborated by some of our own on the appearance and disappearance of this species under the shade of fir-trees in woods in Herefordshire. The firs are always artificially introduced ; and it is not until these have arrived at mature age, towering above the surrounding forestry, and have destroyed the undergrowth of dwarf herbs, that the *Pyrola* makes its appearance. It will then suddenly cover a patch of many square yards, only, however, to disappear in the course of a few years, and display its peculiar leaves in a similar, but distant locality.

“*Pyrola minor*. Woods, B. In a wood at Orange Lane, and in a plantation to the north of Loch Lithtillum, Dr. R. D. Thomson. Blackadder plantations ; plantations at Greenburn ; in woods at Manderston House. Banks of the Dye above Longformacus. In a wood between the farms of Simprin and Swinton Hill ; and in a wood on the farm of Milne-Graden, J. Hardy. In almost every fir plantation in the west of Berwickshire, and in Roxburghshire, Dr. F. Douglas.—Mr. Hardy remarks that *P. media* flowers in greatest beauty when under long heather ; and I have observed of *P. minor*, that, when grown in a pot, the leaf-stalks twist and contort themselves so as to reverse the natural position of the leaf, and make the upper surface look to the ground, in a manner which appears to me remarkable.

“The circumstances that determine the appearance of this plant in our fir plantations are not well ascertained. It springs up in green patches after the baneful shade of the trees has extirpated the aboriginal possessors of the soil, such as the heaths and smaller *Carices*.

In this respect it resembles exactly the *Linnea borealis*. Whence have their seeds come? Have they lain buried and dormant in the soil since the ante-Roman period, when all this part of the country was covered with a forest? I think it not improbable. They were the fair flowers that were wedded away with the destruction and abolition of the shelter and shade that fostered their growth; and that shade being restored, they again revive and occupy their ancient haunts. They are peculiarly wild plants, and dislike civilization; and when we get amongst them, we feel as if the spirit was freed from bondage, and might be left safely to take its flight and freaks, 'playing with words and idle similes.'—P. 139.

The familiar foxglove has the following illustrative passage:—

"*Foxglove*. Often very ornamental in deans, and on rocky ledges that overhang the deep pools of our brattling burns:—

'I've lingered oft by rocky dells
Where streamlets wind with murmuring din,
And marked the Foxglove's purple bells,
Hang nodding o'er the dimpled lin.'

This plant is one of the wonderful ingredients used as 'bath' for sheep, but some shepherds object to its use, for they say that it blackens the wool very much. The leaves afford a medicine of great energy and value; and before this was known to physicians the foxglove or fox-tree was frequently administered by the bold country quack, not always with impunity. See Dalyell's 'Darker Superstitions,' p. 113.—About Greenlaw the plant from its stateliness bears the elegant name of the *King's elwand*:—

'Straight as the Foxglove, ere her bells disclose.'

The flowers were once applied to the purpose of caps by the troops of fairies that did inhabit our deans and sylvan retreats; now our little girls glove their fingers with them, putting them on the top of each other in a pyramid to overflowing, and they call them *ladies' thimbles*. Boys inflate them by blowing into the bell, then they crack them by a smart stroke. They also suck the honey at the base of the flower. Tempted by this nectar, the bee enters deep within the corolla, where, becoming imprisoned, it buzzes about with vexation and rage.

"The foxglove, pronounced to be 'the most stately and beautiful of our herbaceous plants,' could not, of course, escape the eye of Wordsworth; and he has given in the 'Prelude' to 'Retrospect,' p. 223, a correct enough portrait of the plant in its last stage, or old age:—

‘Through quaint obliquities I might pursue
 These cravings ; when the Foxglove, one by one
 Upwards through every stage of the tall stem
 Had shed beside the public way its bells,
 And stood of all dismantled, save the last,
 Left at the tapering ladder’s top, that seemed
 To bend, as doth a slender blade of grass,
 Tipp’d with a rain drop. Fancy loved to seat,
 Beneath the plant despoiled, but crested still
 With this last relic soon itself to fall,
 Some vagrant mother, whose arch little ones
 All unconcern’d by her dejected plight,
 Laugh’d as with rival eagerness their hands
 Gather’d the purple cups that round them lay
 Strewing the turf’s green slope.’

—P. 157.

“*Primula vulgaris*. Many botanists have their favourite flowers around which they associate certain events, feelings and facts, that perchance may be too deep for tears, and which it is good to muse in solitude and silence ; but singularly enough, few have thus married the primrose. It is, however, the favourite flower of my excellent friends Mr. Archibald Hepburn and the Rev. Dr. Landsborough.

“The favourite flower of

Sir J. E. Smith, M.D., was	<i>Geum rivale</i> .
Patrick Neill, LL.D.....	<i>Ranunculus Ficaria</i> .
Rev. Charles Abbot	<i>Alchemilla vulgaris</i> .
Professor Robert Graham, M.D.	<i>Sonchus alpinus</i> .
William Withering, M.D.....	<i>Menyanthes trifoliata</i> .
Rev. Dr. Chalmers	<i>Galanthus nivalis</i> .
Rev. William Kirby	<i>Geranium pratense</i> .
William Bromfield, M.D.	<i>Tamus communis</i> .
William Borrer, Esq., is	<i>Primula farinosa</i> .
Professor J. H. Balfour, M.D.	<i>Astragalus alpinus</i> .
Professor G. W. Arnott, LL.D.	<i>Anagallis tenella</i> .
Robert K. Greville, LL.D.	<i>Saxifraga oppositifolia</i> .
Miss Attwood	<i>Campanula hederifolia</i> .
H. C. Watson, Esq.	<i>Trientalis europæa</i> .
The Author	<i>Oxalis acetosella</i> .”

—P. 165.

The idea of connecting a flower with the name of a botanist is pretty and poetical ; but the lament that *few have thus married the primrose*

is rather curious. Surely the chaste and delicate primrose would not desire more than one bridegroom. But if the botanical suitors of the "love-listening primrose" be few, her poetical ones are many, and none more sincere than the patriotic Elliott:—

" TO THE PRIMROSE.

" Surely that man is pure in thought and deed,
 Whom spirits teach in breeze-born melodies ;
 For he finds tongues in every flower and weed,
 And admonitions in mute harmonies.

Erect he moves, by Truth and Beauty led,
 And climbs his throne, for such a monarch meet,
 To gaze on valleys, that, around him spread,
 Carpet the hall of heaven beneath his feet.

How like a trumpet under all the skies,
 Blown to convene all forms that love his beams,
 Light speaks in splendour to the poet's eyes,
 O'er dizzy rocks, and woods, and headlong streams !

How like the voice of woman, when she sings
 To her belov'd, of love and constancy,
 Thy vernal odours, o'er the murmurings
 Of distant waters pour their melody

Into his soul, mix'd with the throstle's song
 And the wren's twitter ! Welcome then again,
 Love-listening Primrose ! Though not parted long,
 We meet, like lovers, after years of pain ;

Oh, thou bring'st blissful childhood back to me !
 Thou still art loveliest in the lonest place ;
 Still, as of old, day glows with love for thee,
 And reads our heavenly Father in thy face.

Surely thy thoughts are humble and devout,
 Flower of the pensive gold ! for why should Heaven
 Deny to thee his noblest boon of thought,
 If to earth's demigods 'tis vainly given ?

Answer me, sinless sister ! Thou hast speech,
 Though silent. Fragrance is thy eloquence,
 Beauty thy language ; and thy smile might teach
 Ungrateful man to pardon Providence."

The occurrence of the name of *Plantago lanceolata* leads us to mention a plant that occurs in Herefordshire. There are scarcely two species of plants more familiar to the English botanist than *P. media* and *P. lanceolata*. The first has ovate, the last lanceolate, leaves ; the first has long stamens, with beautifully purple filaments, giving

the flower a very attractive appearance ; the last has short stamens, with dingy filaments, and a very common-place appearance. The Herefordshire plant has the ovate leaves of media, and the unattractive inflorescence of lanceolata ; both which species abound in the same neighbourhood. This record is merely episodical : may it induce a competent botanist to investigate the subject.

“ *Plantago lanceolata*. Rib Grass : Kemps. Common in meadows and pastures. June.—Sown with other ‘artificial grasses,’ and eaten with great avidity by all sorts of cattle.—It is customary with children to challenge each other to try the ‘Kemps.’ A kemp consists of the stalk and the head or spike. Of these an equal number is skilfully selected by the opposed parties ; then one is held out to be struck at with one from the opponent’s parcel, which is thrown aside if decapitated, but if not, is used to give a stroke in return. Thus with alternate strokes given and received, the boys proceed until all the Kemps but one are beheaded, and he who has the entire Kemp considers himself the victor. Kemp is synonymous with hero or champion. But the practice has also given to the plant the name of *Fightee-Cocks* amongst the children in Berwick and its vicinity ; and in Durham *Cock-fighters*.

“ It was once, and perhaps still is, a custom in Berwickshire to practise divination by means of Kemps. Two spikes were taken in full bloom ; and being bereft of every appearance of blow, they were wrapt in a dock-leaf and put below a stone. One of them represented the lad, the other the lass. They were examined next morning, and if both spikes appeared in blossom, then there was to be ‘aye love between them twae ;’ if none, the ‘course of true love’ was not ‘to run smooth.’ The appeal, however, generally ended as the parties wished, for, since it is the rule, in the inflorescence of spikes, that the florets blow in succession, the being laid beneath a stone would have little influence in retarding the normal expansion of them, if ready for development. The same, or a similar, superstition prevails in some parts of England : thus Clare in his ‘Shepherd’s Calendar :’—

‘ Now young girls whisper things of love,
And from the old dame’s hearing move ;
Oft making “love-knots” in the shade,
Of blue-green oat or wheaten blade :
Or, trying simple charms and spells
Which rural superstition tells,
They pull the little blossom threads,
From out the knot-weed’s button heads,

And put the husk, with many a smile,
 In their white bosoms for a while,—
 Then if they guess aright the swain,
 Their loves' sweet fancies try to gain :
 'Tis said, that ere it lies an hour,
 'Twill blossom with a second flower,
 And from the bosom's handkerchief
 Bloom as it ne'er had lost a leaf.'"

—P. 170.

In the note which follows, on *Orchis latifolia*, we think there is some little mistake in the application of the provincial names. The terms "Deil's-foot" and "Dead-men's-fingers" will do very well for this species, and for *O. maculata*, to which, indeed, the latter term is generally applied; but the term "Adam and Eve" is confined to *O. mascula*, or, at least, to the group having undivided tubers.

"*Orchis latifolia*. Cocks-Kames. Common in boggy ground, and not easily to be distinguished from the preceding. The root, from its shape, is sometimes called the *Deil's-foot*, and sometimes *Dead-men's-fingers*; but it is more generally known as *Adam and Eve*,—the tuber which sinks being *Adam*, and that which swims being *Eve*. *Cain and Abel* is another name for these tubers, Cain being the heavy one. They are, or sometimes were, used as love-charms. If a woman wished to secure the affection of any young man on whom her heart was set, she put, unseen, one of the tubers into the pocket of his dress, and thus he became so enchanted that he must follow the intriguer wherever she went! This is the very property that Shakespeare ascribes to his Love-in-Idleness."—P. 193.

The following paragraph is replete with poetry and beauty. It may be urged that it has little to do with *Poa fluitans*; but, to us, that is no objection: we love the mind that draws a pleasing simile from such a source,—that perceives a cause for hopeful rejoicing in that which is, for the time being, veiled in obscurity, or oppressed by circumstances; in fact, we love the mind that sees "good in everything."

"*Glyceria fluitans*. Marshy spots in old meadows get very green and fresh in winter, and catch the pleased eye afar off. This is not from contrast with the surrounding barrenness, but from the vegetation of the perennial grasses that occupy a wet soil. Sandy links, on the contrary, are dull and dead, and rough with the persistent stalks of their wiry bents. The tufts of rushes, which stud the wet green meadow, continue to preserve their living colour about the base and half-way up the stalks, but the tops have become dry and withered. A deeper green heightens the effect of the various kinds of

pine, and renders their planting less gloomy in the prospect: but deciduous trees get a settled brown, with, however, red and pleasant tints, from the buds covered up in their varnished scales; and I have noticed that, in the distance, these brown woods are silvered over as with the gray hue of age. It is when in this naked condition that the naturalist studies to advantage the character of the various trees in their mode of ramification; and I remark that the branchlets of the ash and plane are opposite, patent and knobby; those of the elms alternate, zigzag and flabellate; of the oak irregular, kneed, and spreading; and of the willow irregular and erect, but so lithe as almost to droop. The slender twigs of the birch are more decidedly pendulous, and woven almost into an irregular trellis; while those of the beech are regularly alternate and patent.—These are trivial observations? Not so to one of my capacity and tastes: they gave interest to my walk, and that had its value; and, perhaps, I may have read, in this unadorned page of my Book, the lesson that there was a good design, in all the unregulated variety before me, to please and comfort even the sensual eye. The eye, salved with euphrasy and rue, might have seen other lessons which I may not decipher to the full, yet even I could see, in the far distance, Spring and Summer hastening onwards to reclothe the skeletons, apparently so dead to every sweet influence, with green leaves and smiling flowers; and Autumn give the promise of abundant fruits. Is there no lesson in the vision? Many:—and one suits my present humour, which I give in the words to which it was set by a poet two centuries ago:—

‘ I know you would not love, to please your sense
 A tree, that bears a ragged unleaved top
 In depth of winter, may when summer comes
 Speak by his fruit he is not dead but youthful,
 Though once he showed no sap; my heart’s a plant
 Kept down by colder thoughts and doubtful fears.
 Some frowns like winter storms make it seem dead,
 But yet it is not so: make it but yours,
 And you shall see it spring, and shoot forth leaves
 Worthy your age, and the oppressed sap
 Ascend to every part to make it green,
 And pay your love with fruit when harvest comes.’ ”

—P. 214.

'*Some Notes upon the Cryptogamic Portion of the Plants collected in Portugal, 1842—50.* By Dr. FRIED. WELWITSCH; the Fungi by the REV. M. J. BERKELEY, M.A., F.L.S., &c., &c., &c. London: William Pamplin, 45, Frith Street, Soho Square. 1853.'

This little *brochure* is printed for the use of the subscribers to the collections of Portuguese plants made by Dr. Welwitsch. It contains a list of seventy-three species of Fungi; each species being accompanied by a note as to the habitat, plant on which it is parasitic, &c. Twelve of the species are new to science, and we have therefore extracted their characters, thinking they would be useful to the cryptogamic botanists of this country.

"*Phyllosticta hamatocycla*, Welw. No. 4. Maculis latissimis pallidis rufo-cinctis; peritheciis parvis submarginalibus; sporis oblongo subclavatis; sporophoris amplis. On the leaves of *Phormium tenax*; Lisbon, Jan. 1843. *Obs.*—Spots irregular, several inches long, occupying almost the whole breadth of the leaf, surrounded by a rich rufous toothed or entire border. Perithecia rare, mostly marginal. Spores hyaline oblongo-subclavate. Sporophores clavate.

"*Dothidea durissima*. Pustulis elevatis compactis; ostiolis cellularum exasperatis; sporidiis fusiformibus uni-triseptatis. Welw. No. 12. On branches of *Quercus pseudococcifer*, Webb; near Piedale, on the left bank of the Tagus. *Obs.*—Pustules raised very hard and compact about a line broad, rough with the prominent ostiola. Asci clavate; sporidia fusiform, at first uniseptate, but eventually a septum is formed in either of the divisions; each endochrome contains a large nucleus. I have seen only two sporidia in each ascus.

"*Gymnosporium inquinans*. Sori elongatis aterrimis; sporis lævibus obscuris ovatis vel subellipticis. Welw. No. 20. On dead stems of *Arundo Donax*, near Lumiar. *Obs.*—Forming linear elongated at length confluent sori, consisting of dark even ovate or subelliptic spores, which spring from short, sometimes forked threads. This species is common, but I believe it is undescribed.

"*Phyllosticta Ceratoniae*. Maculis nigro limitatis irregularibus; sporis minutis anguste ellipticis hyalinis. Welw. No. 37. On leaves of *Ceratonia siliqua*, in the Serra of Arrabida. *Obs.*—Spots very irregular, often marginal, surrounded by a raised dark line, gray or dusky. Spores minute elliptic narrow hyaline.

"*Perisporium nitidulum*. Nitidum nigrum in maculas congregatum; peritheciis minutis hemisphericis; sporidiis subglobosis minutis fuscis. Welw. No. 38. On dead leaves of *Agave Americana* with *Nectria sanguinea*, *Sphæria herbarum*, &c., near Situbal. Forming little black patches consisting of numerous shining black hemispherical minute perithecia. Sporidia minute subglobose or broadly subcymbiform. I have not seen asci, but in several species these are very soon absorbed and the habit is that of *Perisporium*.

"*Phoma Erythrinae*. Peritheciis ostiolisque prominulis; sporis oblongo linearibus hyalinis. Welw. No. 46. On dead branches of *Erythrina Crista Galli*; Lumiar and elsewhere near Lisbon; mixed with *Sphæropsis crassipes*, scattered. Perithecia prominent raising the epidermis which remains unaltered and piercing it by a rather prominent ostiolum. Spores linear, oblong, one three thousandth of an inch long, one sixth as much thick, sporophores about twice as long delicate.

"*Sphæropsis crassipes*, Mont. MSS. Gregaria epidermide tecta; maculis peritheciorum irregularibus atris centro albis; sporis oblongis; sporophoris subrobustis. Welw. No. 46. On dead branches of *Erythrina Crista Galli*; Lumiar. The perithecia occur in irregular patches extending several inches. The cuticle above each perithecium is of a shining black, but white in the centre. Sporophores nearly twice as long as the spores, rather stout; spores oblong, subelliptic, one seventeen hundred and fiftieth of an inch long.

"*Septoria brunneola*, Berk. Peritheciis epidermide brunneo tectis; sporophoris rectis; sporis sursum curvatis filiformibus dimidio brevioribus. Welw. No. 46. On dead branches of *Erythrina Crista Galli*, sparingly; mixed with *Sphæropsis crassipes*, Mont. Perithecia scattered or arranged two or three together in a line covered with the cuticle, which is raised just above them, and of a dull brown. Spores filiform, curved, about one eight hundred and seventy fifth of an inch long, about twice as long as the filiform straight sporophores.

"*Valsa Welwitschii*. Pustulis parvis circumscriptis; stromate pallido; peritheciis globosis immersis albofarctis, collis longiusculis; ostiolis convexis subpunctiformibus; ascis tenellis; sporidiis curvulis. Welw. No. 47. On the smooth bark of elms; Cintra. Pustules scarcely one third of a line broad, elevating the bark; disk narrow; stroma pale; perithecia globose immersed about five in each pustule, sometimes however solitary, neck rather long; ostiola convex subpunctiform; asci short, very delicate, sporidia eight minute oblong curved.

"*Depazea crepidophora*, Mont. MSS. Maculis orbicularibus fuscis sero griseis fusco limitatis; peritheciis minimis; ascis crepidiformibus minutis; sporidiis oblongis uniseptatis. Welw. No. 51. On living leaves of *Viburnum Tinus*, near Caldas da Rainha, August, 1850. *Obs.*—I have not been so fortunate as to find perfect fruit in this species, and I therefore describe it from a sketch by Dr. Montagne.

"*Septoria Pisi*. Maculis parvis orbicularibus; sporis filiformibus breviusculis robustioribus. Welw. No. 64. On leaves of *Pisum sativum*, in fields near Ajuda, March. Distinguished by its more robust and shorter spores.

"*Phoma Cacti*. Maculis suborbicularibus l. effusis; peritheciis majoribus prominulis; sporis minutis oblongo ellipticis; sporophoris filiformibus. Welw. No. 72. On dead *Cactus peruvianus*; Lumiar. *Obs.*—Bursting through the cuticle and having the aspect of a minute *Diplodia*."

'*The London Catalogue of British Plants. Published under the direction of the Botanical Society of London. Adapted for marking Desiderata in Exchanges of Specimens, &c.* Fourth Edition. London: William Pamplin, 45, Frith Street, Soho. 1853. Price 6d.'

The issue of a fourth edition of this Catalogue affords irrefragable evidence of the progress of British Botany, and of the success of that Society whence it emanates. The prominent characteristic of the Botanical Society of London is the exchange and dissemination of well-named specimens; and in this it has fairly distanced every competitor. Indeed, so decidedly is this the case, that, numerous as are the notices and advertisements which have reached us, we scarcely know whether any of the competing Societies have outlived their announcement, whether they still exist, or still aim at carrying out their views according to their own programme. Perhaps we cannot do the botanists of this country a better service than recording, we might say reiterating, the conditions under which the distribution of specimens is carried out.

"The Botanical Society of London is a central institution for effecting exchanges of Specimens between Members of the Society in any part of Britain; also, for exchanges with Foreign Botanists, who are not required to become members in order to obtain the same privilege.

"Members send their spare duplicates to the central depôt in

London, and are entitled to claim, in return, such British or Foreign species as the Society's store of duplicates may afford. A preference in the supply of their desiderata is given to those contributors who most exactly conform to the subjoined Regulations.

"The Annual Subscription entitles any member to claim fifty species, without the obligation of contributing specimens to the store; priority still being given to the claims of actual contributors in selecting desiderata.

"*Desiderata of Members.*—These can be applied for by prefixing short horizontal marks (—) to the names of the desiderated species or varieties in a copy of the 'London Catalogue of British Plants,' published for this purpose by the Society. If a manuscript list be sent instead, it must correspond exactly with the printed Catalogue, latest edition, in the names and prefixed numbers or letters, and also in their order of sequence.

"*Desiderata of the Society.*—Lists of desiderata will be sent to the contributing members annually. To prevent the accumulation of useless specimens, and to avoid the needless destruction of rare plants, contributors are requested to send only the species asked for by the Society. An exception to this rule may properly be made in the case of newly discovered species not yet entered in the Catalogue, or of any remarkable varieties not included therein.

"*Time of sending Parcels.*—This is optional with the contributor; a return parcel being made up as soon as practicable after the receipt of one from him. But the best return can be made for parcels received near the end of the year; and it is also most convenient to the Society that parcels should arrive in December;—least convenient, between December and April.

"*Number of Specimens.*—In a parcel of British plants, it is generally more convenient to the Society that there should be only few species (say, one to ten species) and many duplicates (say, ten to a hundred specimens, according to rarity), of each species.

"*Character of Specimens.*—The specimens should be such as to show clearly the distinctive characters of the species, and be otherwise as perfect examples of it as possible. Small plants should be sent entire, roots included. Long plants should be bent or folded before drying. No fragments ought to be sent, unless those of trees or other large and branching plants which cannot be folded within suitable dimensions if entire. Unsuitable specimens are destroyed, and unprofitably waste the time of the distributors in separating and removing them.

"Size of Specimens.—The Society's paper for duplicates is seventeen inches in length. Specimens should be two inches shorter than the paper, in order to lessen the risk of breakage, consequent on repeatedly turning over the duplicates while selecting desiderata.

"Preservation of Specimens.—The specimens are to be pressed in porous paper, sufficient in quantity to dry them rapidly, and thus to preserve their colour; and to be placed under a pressure sufficiently heavy to keep their leaves from becoming wrinkled, and consequently too brittle when dry.

"Labels.—All British specimens are to be sent ready labelled by their contributors. The labels are to be attached to the specimens, either by a slit at their base or otherwise, as convenient; care being taken that the name and number of the plant are never concealed or obscured by any part of the specimen lying across them. The labels are expected to show the following particulars:—1. The *No.* of the species, or *No.* and *Letter* of the variety, according to the 'London Catalogue,' placed at the upper left-hand corner of the label.—2. The name of the *Species* or *Variety*, from the same Catalogue, always with the addition of the authority after the name.—3. The name of the *County* in which the specimen was gathered; together with any more exact description of the locality which the contributor may think desirable.—4. The name of the *Contributor*, placed at the bottom of the label; that of the *Collector* also being added, if not the contributor himself.—5. The words '*Botanical Society of London*' are not to be used on the labels of contributors unless by express authority from the distributors in London.

"N.B. In the 'London Catalogue' the names of authorities are occasionally too much abbreviated, from want of space in the line.

"Attention to Regulations.—Exact attention to the preceding regulations is earnestly entreated. Where specimens have to be examined, sorted, arranged, and re-distributed in many thousands annually, uniformity and exactness become matters of the utmost importance. It is impossible for distant members to know how greatly any deviations (such as may be fancied very trifling deviations from rule) will impede the routine of management in London, and thus very inconveniently increase the heavy duties of the distributors."

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Fiftieth Sitting.—Saturday, October 22, 1853.

MR. NEWMAN, President, in the chair.

The President read the following communications :—

New Westmoreland Station for Woodsia Ilvensis.

“A new station for *Woodsia Ilvensis* has been found in Westmoreland. As it is many miles from the Teesdale habitat, I consider it an interesting and important discovery. It was found by Isaac Hudhart, a gardener, who has studied the ferns, and has been very successful in finding all the best ferns of this district. He has very wisely told no one about the locality of the *Woodsia* but myself; for I consider it absolutely necessary to keep secure the habitats of good ferns now, as, if known, they are sure to be exterminated. There may be about twenty plants. I enclose a frond, to enable you to verify my statement.”—*Frederic Clowes; Holly Hill, Windermere, September 14, 1853.*

The President observed, that the fronds kindly transmitted with this note are similar to those gathered on Falcon Clints.

Lastrea rigida near Bath.

“Observing in the last number of the ‘Phytologist’ (iv. 1101) that a solitary plant of *Lastrea rigida* had been found near Bath, by J. E. Vize, Esq., may I suggest the possibility, if not the probability, that it had been planted there by *Potter*, a well-known fern-collector, now dead, *en route* to Cheddar for *Polypodium calcareum*; having heard from his own mouth that he did so with other plants, in order to save their extermination.”—*G. B. Wollaston; Chiselhurst, Kent, October 5, 1853.*

Agrimonia odorata in Hampshire.

“I have much pleasure in announcing the discovery of *Agrimonia odorata*, *Miller*, in the northern part of Hampshire. I gathered it on the 13th of September, at Tucker’s-Hill Farm, in the parish of Kingsclere; and at Inhurst Farm, in the parish of Banghurst. In both places it was growing in considerable abundance; and, at the latter,

some of the specimens were five feet high. In all probability, it will be found plentifully throughout the country lying between the river Embome and the Hampshire Downs."—*W. Mathews, jun. ; Edgbaston House, Birmingham, October 3, 1853.*

Filago spathulata near Woodstock.

"It may be worth while to record the occurrence of *Filago spathulata*, *Presl*, in the neighbourhood of Woodstock. I gathered it on the 11th instant, about half a mile from the town, where it grows abundantly, in waste places by the side of the Oxford road."—*Id.*; *October 18.*

Lastrea Thelypteris in Warwickshire.

"Since the draining of the bog at Allesley (see *Mag. Nat. Hist.* vol. v. p. 199), I have had no reason to believe that *Lastrea Thelypteris* has ever been met with in Warwickshire. About three weeks ago, a few specimens of this fern were brought to me, for examination, by Mr. Henry Bromwich, gardener, of Myton. Last Tuesday (October 11), accompanied by Mr. Bromwich, I visited the locality, a swamp, indicated on the Ordnance Map by a faint nebulous mark, about four miles N.N.W. of Warwick, half a mile N. of Goodrest Lodge, and within a few yards of Rounsel Lane. We found this beautiful fern growing in great abundance, and of unusually large dimensions. The fronds were from two feet and a half to four feet high."—*W. G. Perry ; Warwick, October 17, 1853.*

Aceras Anthropophora, and Ferns with bifid and multifid Fronds, in Jersey.

"I found, the other day, at Rozel, a plant of the *Aceras Anthropophora*, in seed ; so there is another plant to be added to Babington's Catalogue. I have been shown specimens of the following ferns, with the extremity of the fronds bifid, and sometimes multifid, which have been gathered in the Island ; *viz.*, *Asplenium Trichomanes*, *A. Adiantum-nigrum*, *A. lanceolatum*, *Blechnum boreale*, *Polypodium vulgare*, *Aspidium Filix-mas*, and *Scolopendrium vulgare* ; but, I believe, this last is frequently found in that state. I have myself found a plant of *Aspidium angulare* in which some fronds were bifid and others multifid ; and there was only one frond in the whole that was simple."—*M. Piquet*, in a letter to N. B. Ward, Esq., who kindly communicates it.

Lathyrus latifolius near Glastonbury.

"I was lately shown the broad-leaved everlasting pea (*Lathyrus latifolius*) growing in a wood on Ivythorn Hill, near Glastonbury. My friend who showed it me had known it there for twenty years, or more; and it had the appearance of being perfectly wild; but it was confined to one spot; nor, after a search of two or three hours, could we find it anywhere else in the neighbourhood. We found, however, two other rare plants, growing not far from it, *Lithospermum purpureo-cæruleum* and *Astragalus glycyphyllos*. I enclose a pair of the leaflets of the *Lathyrus*, by which it will be seen that I have not mistaken a broad-leaved variety of *L. sylvestris* for it."—*Thomas Clark*; October, 1853.

Trichomanes speciosum in Ireland.

Mr. Newman made the following observations:—"The old *saw* of 'Eyes and no Eyes' is often brought to my mind by the records of botanical tourists; and no species so frequently calls it to remembrance as *Trichomanes speciosum*. One writes that 'the fern is extirpated from the Killarney district;' a second, that it has 'long ceased to exist at the old station at Turk Waterfall;' a third, that it 'exists in fifty stations all round Killarney;' and a fourth, that it is 'abundant and luxuriant, at the present moment, at Turk, and may be seen from one of the points to which tourists are taken to view the fall.' The last account is verified by the transmission of specimens, and emanates from one whose word is not open to question."

MALVERN NATURALISTS' CLUB.

Meeting at Knightsford.

On Tuesday last, the 14th inst., the Malvern naturalists held their September field meeting, at Knightsford Bridge, where they were joined by a party from this city, and a deputation from the Worcester Club. The vicinity of Knightsford is not exceeded in picturesque beauty by any part of the county of Worcester; and many have been the pleasant parties here, as mine host of the cozy inn at the Bridge could bear witness. Here, too, in twilight times long gone by, several geological formations took a fancy to join company; and the "faults" they then committed are still commented upon by those

who, strange as it may seem, profess acumen sufficient to see through a stone wall ! But as, according to the dictum of the poet, there never was a faultless piece, so the slips of geology may be deemed but venial, since the level surface of the earth is thus modified, and a wilderness of beauty is formed out of a chaos of débris. Such is the case about Knightsford and Ankerdine ; and this country the lovers of Nature were now about to explore. After some preliminary business, under the Presidency of the Rev. W. S. Symonds, Rector of Pendock, the exploration commenced, under the direction of Mr. E. Lees, F.L.S., who had formerly the advantage of going over the same ground with Dr. Buckland. Rosebury Rock, on the southern bank of the Teme, was first visited ; and on the way to it a remarkable spot was examined : where the Silurian ridge, in its progress from Suckley, suddenly terminates, a great fault throws the new red sandstone unconformably against the old red ; and, a denuding or displacing force having at an early date swept away the divided Silurian beds, the Teme at present glides through a channel that originally admitted a current of the primæval sea. The verge of Rosebury Cliff, 378 feet in altitude by the trigonometrical survey, was now approached, and the word given to descend its almost perpendicular face, which was at length safely effected. As a picturesque object, Rosebury forms a beautifully wooded mass, shadowing the rapid Teme that bathes its base. In its cool, shadowy recesses *Scolopendrium*, *Polypodium*, and other ferns, grow much more luxuriantly than usual ; and it may be searched with advantage for mosses and the *Cryptogamia*. The rarer plants now gathered were *Cotyledon Umbilicus*, *Teesdalia nudicaulis* (very fine), *Potentilla argentea*, and *Campanula Trachelium*. Poetical wanderers may be interested in knowing that this rock was a favourite haunt of the fairies ; and in the lane near it is a large old maple-tree, called *Bate's Bush* : the said maple growing, as traditionally stated, from a stake driven through the body of a poor suicide ; and in connexion with which Mr. Allies, in his 'Antiquities and Folk-lore of Worcestershire,' has recorded a most horrible tale of "something like a black pig," and "a man without a head," seen there by credible observers, of course at the witching hour of night !

The declining autumnal season lessened the number of plants generally gathered by the botanists of the party ; but it may be noticed as a pretty feature that the crest of the hill was purple with the flowery ling (*Calluna vulgaris*) ; while the bushes on the margin of the woods were prettily wreathed with the virgin's bower (*Clematis*

Vitalba), almost the last blossom of the year that falls from Flora's lap. The orpine (*Sedum Telephium*) was also gathered, in flower, upon Ankerdine, and quantities of the pretty eyebright (*Euphrasia officinalis*) decorated the grassy slopes. A very singular vegetable appearance attracted every eye near Collins' Green, and caused all to mount up the bank, to examine it. A dwarf oak, growing on a prominence not far from the road, appeared to be covered with ruby-glowing fruit, of the size of grapes; indeed, delicious in aspect as the bunches depending from the most luxuriant vine. They were found to be a most astonishing growth of *gall-nuts*, that in maturity very much simulate the appearance of a ripe strawberry; but such a quantity as here appeared were surely never before seen! The boughs of the oak were literally bent down with their clusters, some of the leaves having as many as twenty large gall-nuts upon them, and numbers had from four to ten; altogether the tree must have borne thousands. These gall-nuts arise from the puncture of a small hymenopterous insect, called *Cynips quercifolia*; and the liquor deposited has the effect of inducing the tissue of the leaf to be thus metamorphosed into apparent fruit, which really nourish a young grub within each of them. These pretty-looking galls, being tasted, were pronounced "bitter as soot," and as belonging to the *Unedo* family, only fit to be once eaten! In fact, they are strikingly analogous to the celebrated apples of Sodom, which are proved to have been galls of a larger kind, and which were so tempting to look upon, but crumbled into bitter ashes when any one attempted to eat them. They were reported to grow on the shores of the Dead Sea; and Milton appropriately introduces them into Pandemonium, as a dessert for the "thrones and dominations" he places there. The galls formed by the *Cynipidæ* take various forms; and the little, flat, brown disks, often seen on the under side of oak-leaves in autumn, are of the same nature, though commonly regarded as small *Fungi*.

From the deceptive, simulating fruit-tree, specimens of which were carried off, the party took the route for Berrow Hill, whence they returned by way of Horsham and the copses along the Teme-side; and a pleasant walk through orchards and meadows brought them back to Knightsford. In this last part of the route were gathered *Jasione montana*, *Picris hieracioides* (plentiful), *Inula Conyza*, and many species of *Rubi*, now blackening the hedges with their fruit; *Rubus tenui-armatus* more particularly noticeable. Also, among *Fungi*, the blood-coloured *Boletus scaber*.

The labour of observation being at last ended, none were found

missing from the abundant spread which mine host of the 'Talbot' had provided, and which was duly honoured in the attack and destruction thereof. But philosophers only eat and drink to live, and soon get again to their mental enjoyments. After a loyal toast or two, the Rev. F. Dyson, V.P., said, that as their labours in the field would be soon ended, they had still resolved that they would try, even within doors, to extend the love of their favourite study; and thought that a short course of lectures, delivered at Malvern, where there seemed a desire to embrace such an opportunity, would have a good effect. The Vicar of Malvern had, in the most kindly spirit, offered them the use of the Lyttelton school-room; and they could thus have a monthly lecture through the autumn and winter. The President said he could promise them the aid of Professor Buckman on Geology; but his idea was to commence with Field Botany, before all the flowers were gone; and he had induced his friend, Mr. Lees, to give them a subject they all knew he was so familiar with. He would, then, with their permission, take October the 13th for their inauguration day, and after some general opening remarks leave his friend to guide them into flowery paths, in his own peculiar way. Their worthy Secretary, Mr. Walter Burrow, would undertake the necessary arrangements; and they could have tickets from him. To make the matter still more pleasant, they intended a last meet for the season, the day after the lecture, which must, however, be at Eastnor, as a kind friend of his near Ledbury had authorised him to invite the Club to his hospitable board; and he trusted they would all respond to the invitation. A communication was then read from Mr. Baxter, of Worcester, as to his discovery of *Udora Canadensis*; and Mr. Lees, on the call of the President, entered into its history. The proceedings closed with a feeling and eloquent speech from the President, in reply to his health being given, and most warmly responded to. He said that their meetings were full of interest and delight, pleasant and beneficial to all of them. When he commenced the study of Natural History, he found the want of that friendly communion which would have much lessened his labours; but he had since enjoyed many associations like the present; and, independent of their higher mental influences, they had the advantage of bringing able and amiable observers together, who could confer on many points without ceremony; and thus they got occasionally in presence even with the heads of science, with whom otherwise they might never have been acquainted.

ROYAL PHYSICAL SOCIETY OF EDINBURGH.

Botanical Expedition to Oregon.

At one of the late meetings of this Society, Andrew Murray, Esq., W.S., read a paper "On some Insects from the Rocky Mountains, received from the Botanical Expedition to Oregon, under Mr. Jeffrey," which was prefaced by the following remarks:—

"Most of the members of this Society who are botanists and horticulturists are probably aware that an expedition to Oregon and the Rocky Mountains, for the purpose of procuring seeds and plants from that quarter, has, some time since, been organized, by an association of gentlemen interested in the arboriculture and horticulture of Scotland, and is at present in the course of being carried out. It will, perhaps, be interesting to those who have not heard of the association, if I give a brief notice of its origin and present position.

"I do not know who first introduced the plan of sending out collectors to different countries, to procure seeds and plants as a commercial speculation; but during the last half century it has been carried to a very considerable extent by our principal nurserymen, many of whom have fitted out expeditions at a large cost; by which means many very valuable plants have been introduced into this country. Other expeditions, of a like nature in all but their commercial object, have been sent out by private individuals or societies. The London Horticultural Society have sent out several collectors to different quarters; and it was the success of one of them which may be said to have given rise to this association. The one I allude to was that of Douglass to the river Columbia, where, the climate being much the same as our own, most of the plants he introduced have been found hardy, and have readily been naturalized. It was to him that we owe the *Abies Douglassii*, the *Ribes sanguinea*, or flowering currant, our most beautiful *Pentstemons*, and many other flowering plants. The success of this expedition, and the accounts received from Douglass and others of the magnificence and beauty of the pine-trees in that country, particularly struck Mr. Patton, of the Cairnies, in Perthshire,—a gentleman who has more peculiarly directed his attention to the pine tribe, and is at present engaged in a series of experiments on their cultivation, and suitableness for this climate, which will be doubly valuable, from their practical nature. It struck Mr. Patton that it might be possible to get a sufficient number of gentlemen to combine together to raise funds to send out a collector,

to more fully explore the country which had already proved so fruitful, and to send home from it, and from the neighbouring districts, seeds of new hardy trees, shrubs, and flowers. He communicated his idea to Professor Balfour, who, with his happy freedom from jealousy (a quality which is not always found among scientific men), at once not only approved and adopted the idea, but immediately gave his best energies to working it out. Two other gentlemen, well known in this city for the readiness with which they forward any scheme having for its object the public benefit (I mean Lord Murray and Sir William Gibson-Craig), principally aided in setting the scheme a-going. Through their kind offices, the protection of Government, and of the Hudson's Bay Company, were obtained. Other gentlemen, of whom I shall only mention Mr. M'Intosh, of Dalkeith, aided in procuring subscribers; and in a short time the Association found itself in a position to carry its objects into effect. The project was broached in November, 1849; and by the first fleet of the Hudson's Bay Company's ships which left this country after that, Mr. Jeffrey, a young and zealous botanist (who had been appointed collector), set sail for America. He arrived at York Factory in August, 1850, and at once pushed westwards, for the Rocky Mountains. He travelled with one of the Hudson's Bay Company's brigades, till they reached Cumberland House, where the brigade wintered. Mr. Jeffrey there found that he would lose a whole season if he remained till the brigade started in spring, and, with great energy, at once resolved to go on with what is called the winter packet. This packet starts from York Factory, in Hudson's Bay, in the month of December, and is carried by men, on their backs, from post to post, till it reaches the Rocky Mountains. Mr. Jeffrey started with this packet from Cumberland House, on the 3rd of January, 1851, and reached Jasper's House, on the Rocky Mountains, on the 21st of March. In one of his letters, he says:—'All this distance (1200 miles) I walked on snow-shoes; the snow being, on an average, two feet deep. During this journey I slept with no other covering than that found under the friendly pine, for the space of forty-seven nights; on several occasions the thermometer standing from 30° to 40° below zero.' Mr. Jeffrey was thus enabled to commence his labours in the spring of 1851; and a portion of the seeds he then collected was received last autumn, in fine condition. Among the seeds which have been received are those of several very interesting trees and plants. There is a beautiful new pine, which grows to the height of 150 feet, and has a circumference of 13½ feet at the base. This first-fruit has been rightly named *Abies*

Pattonii. There are also two Piceas, one of which (supposed to be *Picea lasiocarpa*) grows to the height of 250 feet; and the other (supposed to be new), to the height of 280 feet. We can hardly realize the idea of such stupendous trees; but it may help us to some notion of their height if I compare them with some familiar object here. The height of the brick stalk of the Gas Company's chimney, from the stone pedestal, is 264 feet (the pedestal is 65 feet); the top of that chimney is five feet higher than the top of Nelson's Monument; so that if we fancy a tree growing down in the valley between the Canongate and the Calton Hill, on an eminence the height of the pedestal, and overtopping Nelson's Monument by ten feet, we may form some notion of the monarchs of the forest which are now being introduced into this country."

THE PHYTOLOGIST CLUB.

One Hundred and Fifty-first Sitting.—Saturday, November 26, 1853.—MR. NEWMAN, President, in the chair.

The President read the following communications:—

Thymus Serpyllum and T. Chamædrys.

"I have, during the last ten years, paid much attention to the habits and physical difference of these plants, which are nearly allied to each other in appearance; and will give such descriptions as will enable the novice in Botany to detect them.

"The name of *Thymus Serpyllum* was formerly applied to both species, botanists considering them as one; but still *T. Serpyllum* may be significantly applied to one, which I will describe first. *Thymus Serpyllum* creeps and roots along the earth over a considerable space, and remains many years. It comes into bloom about the middle of June, has a slight smell of lemon, and tastes a little aromatic; which taste and smell, as also its stratal adaptation, which I would call the geology of plants,—a study most interesting to the botanist and agriculturist,—are essential to its discrimination. It prefers a very dry sandy soil on rocks, and in ditches and dry pasture-fields.

"*Thymus Chamædrys*, for it has obtained that name, comes into bloom about the middle of July, always a month, or nearly so, later than the other species; has a pungent, acrid taste; a powerful smell,

similar to *Oleum Origanum* ; keeps in bloom frequently until the middle of November, which the other seldom does after August ; and is altogether a larger plant, with the branches longer and straggling, growing in tufts, seldom found on dry sandy rocks or very dry ditches, but abundant in pastures, and stiff, cold soils, where *T. Serpyllum* is never found. It does not creep and root like the latter, unless the ants build their citadel around the stems, which they much like to do. The *Thymus* flourishes remarkably from this incident. These old ant-hillocks are beautiful objects in our pastures, when densely covered with the blooming *Thymus*, like so many coronets of gems.

“ I have now pointed out to the exploring botanist the characters of these two very distinct species of British *Thymus* ; whereby they may be identified at any season of the year. Should botanists not be able to do so, the sheep will, being the better phytologists : they will readily eat the one, but will not touch the other, on account of its pungency.

“ Some years ago, I pointed out the difference between these two plants to several eminent botanists, and sent specimens to others. I also sent specimens of each to the herbarium of the Worcestershire Natural-History Society. Probably from not studying their different habits, I did not then consider them distinct species. I believe no two plants belonging to the same genus have a greater physical difference. I have raised many plants, of each species, from seed, which exactly followed the present plants. A specimen of each is enclosed.”
— *George Jorden ; Bewdley, October 25, 1853.*

Trifolium resupinatum in Cheshire.

“ Whilst lately reviewing my British specimens of the genus *Trifolium*, I was reminded of the possession of a fine example of this species. It was presented to me, in the autumn of 1847, by my friend, S. Thompson, of York, who had collected it a few weeks before in the neighbourhood of the Magazines, near New Brighton, on the Cheshire side of the Mersey. Neither of us being at that time acquainted with the species, the specimen was duly labelled, and laid aside amongst my papers, and was not recognized as *T. resupinatum* till quite recently. It would be desirable for those who may have an opportunity of visiting the locality to search for it again, as it is not unlikely that this species might thereby be restored to an honourable position amongst our indigenous plants. It may be worth while to remark that the same station produces its nearest ally amongst British species, *T. fragiferum*.”— *John G. Baker ; Thirsk.*

Trifolium agrarium in Hertfordshire.

"I may also take this opportunity of mentioning, that amongst a collection of plants made in the neighbourhood of Hitchin, in the years 1815, 1816, and 1817, is a specimen of *T. agrarium*, *L.* As it has not been heard of since, and it is a plant too conspicuous to be easily overlooked, it seems most probable that it has been only a casual introduction; although, from its continental distribution, this species would seem not unlikely to occur in a wild state in this country."—*Id.*

Bifid and Trifid Ferns.

"The remarks of M. Piquet (*Phytol.* iv. 1135) tend to confirm a belief I have some time held, that *all* ferns have a tendency to become bifid, and in some instances multifid. Several of those named by that gentleman I have gathered in this county, in a bifid state, and *Aspidium Filix-mas*, *Hooker*, multifid. One specimen of *Aspidium angulare* I possess very distinct, being divided as much as *nine* inches down the frond. A friend recently received, from Hampshire, a frond of the rare *Asplenium fontanum*, which is likewise bifid. *Polypodium vulgare* assumes the most fantastic forms: I have a great number of varieties of this plant which, step by step, connect it with *P. Cambricum*. Thus we see this tendency pervading many ferns, from some of the commonest to one of the rarest; and I doubt not others might be discovered. Is this state permanent? As far as *Scolopendrium vulgare* goes, I believe the multifid variety has been growing in one habitat in this county for some years; thus giving a colour to the belief that these forms *may* be permanent, if *undisturbed*. Two spots where I have found the bifid variety of *S. vulgare* I intend to examine again next year, to see if the forms are reproduced."—*T. W. Gissing, Worcester, November 7, 1853.*

Udora Canadensis and Potamogeton trichoides in Norfolk.

"I forward you a specimen of *Udora*, which I met with in a pond at Swainsthorpe, Norfolk, on Sept. 20, 1853. With its history in connexion with the pond I have no means of becoming acquainted. The latter is about 170 paces in circumference, and its margin so overgrown with bushes that I had difficulty in getting at the plant. There is neither navigable river nor canal in its neighbourhood.

"Respecting *Potamogeton trichoides*, further search has led to the discovery of a more extended distribution of it in Norfolk. Last

year, I met with it in two additional ponds, in the parish of Swardeston. I have this year to add another in the same parish, three in the parish of Marlingford, one in that of Flordon, and one in Alington. I enclose specimens, in fruit, from these localities."—*Kirby Trimmer; Norwich, October 13, 1853.*

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

(Continued from page 1108).

Flax Plant.

A paper by Prof. Hodges, intituled 'Report on the Gases evolved in Steeping Flax, and on the Composition and Economy of the Flax Plant,' was read.

The investigations directed by the Association, at the Belfast Meeting, with respect to the gases evolved in the steeping of flax and the composition of flax straw, are in progress, and will be reported at the Meeting. The gases of the fermenting vat have been analyzed by the methods of Prof. Buusen, and have been found to consist of carbonic acid, hydrogen, and nitrogen. No sulphuretted hydrogen has, in any case, been detected. Several analyses of the proximate constituents of the dressed fibre and of its inorganic ingredients have been made, which show that a considerable amount of the nitrogenized and other constituents of the plant are retained in the fibre, even after steeping and dressing have removed the structures unsuitable for textile purposes.

Vegetable and Animal Organisms.

A paper by R. Warington, Esq., 'On Preserving the Balance between Vegetable and Animal Organisms in Sea-water,' was read.

The public were first indebted to Mr. Warington for a statement of the conditions in which animals could be kept in fresh water without changing the water. It is not sufficient that there be plants alone; but where the higher animals, such as fish, are kept, it is necessary that some beings should exist which will feed on decaying vegetable matter. This desideratum is supplied by the various forms of phytophagous Mollusca. The author's success with fresh water led him to try experiments with sea water, and the results of his investigations were given in this paper. The most important fact esta-

blished was, that marine animals could be kept in sea water without changing in the same manner as in fresh. The conditions of the existence of sea-water creatures are, however, much more varied than those of fresh; hence the difficulty had been proportionally great in arriving at a successful issue. The nature of the plants in the first place is a matter of importance. The author found that the green sea-weeds answered better than the red or brown. In introducing animals they should be healthy and uninjured. Those should not be put together which devour each other. Crabs, especially the common crab, are very destructive; so are gobies, blennies, and rock-fish. The sea-water should be kept of a proper gravity. It should be 1.026 at a temperature of 60°. Rain or distilled water should be added from time to time to supply any loss. All dead animal or vegetable matter of any kind should be removed.

Dr. Daubeny stated that he had erected some fresh-water tanks at Oxford; but the difficulty which he had to contend with was the growth of *Confervæ*, which interrupted the growth of the other plants.

Dr. Walker-Arnott stated that he had no doubt the reason why the green sea-weeds answered better than the brown or red was that the latter were deep sea, whilst the others were shallow water; plants. The brown and red sea-weeds also had a much denser tissue externally than the green sea-weeds, and did not grow so fast.

A paper by Dr. Astley Price, 'On the Pentasulphide of Calcium as a Remedy for Grape Disease,' was read. (See *Phytol.* iv. 1104).

Germination of Seeds.

A paper by R. Hunt, Esq., 'On a Method of Accelerating the Germination of Seeds,' was read.

The process consisted in covering the germinating seeds with glass coloured blue with cobalt. The author read a letter from the Messrs. Lawson, in which they stated that by allowing seeds to germinate under blue glass, they had succeeded in raising a larger number of seeds in a given time, as well as producing germination in a shorter time.

Report on the Vitality of Seeds.

The report, by the late H. E. Strickland, Esq., gave an account of the seeds which had been planted during the past year; from which it appeared that the older the seeds were, the less numerous were those that germinated. The author thought that the experiment of

Mr. Hunt suggested an alteration in the plan which they had hitherto adopted, which would undoubtedly be attended to by the Committee.

GERMAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.*

The German naturalists and physicians held their thirtieth meeting this year at Tübingen, on the 18th ultimo. It was attended by about 580 members, including a moderate sprinkling of French and Russians, two Americans, and a few English.

The meeting at Tübingen was not so numerous as that last year at Wiesbaden. Tübingen, though offering considerable attractions, by its situation in one of the finest parts of Swabia, by its scientific institutions, and by its reputation as a University, is not yet connected with the great European railway net; and people do not like travelling now in slow mail-coaches even for a day. Another cause was, that the President, Professor Hugo von Mohl, elected last year, did not do his duty. For reasons best known to himself, he did not appreciate the honour which the votes of nearly 1000 scientific men from all parts of the world had conferred upon him. Instead of endeavouring to further the object of the Society, he tried everything in his power to prevent the meeting from being held at all; and when he found that the patriotism of his townsmen did not allow them to go the same way with himself, he departed for Italy, leaving the whole business to be arranged by the Vice-President, Mr. Bruns, Professor of Medicine at Tübingen. Professor Bruns, much to his credit, took up the matter warmly, and so thoroughly succeeded in arousing the interest of the University and the towns of the neighbourhood, that the reception of the learned guests was of the most cordial nature. Tübingen itself had a very festive appearance. Outside the gates of the city triumphal arches, with streamers and flags floating upon them, had been erected, and within, nearly every house was decorated with garlands of oak-leaves and gay flowers; whole spruce-trees had temporarily been planted before some of the buildings, and even in the dwellings of the humbler classes of inhabitants, attempts—aye, and some very successful ones—had been made to do something towards showing that the strangers were heartily welcome. It is unnecessary

* From the 'Literary Gazette,' October 22, 1853.

to develop the effect which such a reception produced upon the meeting; every one seemed to be happy, and at the first general dinner there was such a profusion of spirited speeches and toasts as are seldom heard on similar occasions. Preserving the scientific form, and moving only within the bounds of scientific terminology, several of the speakers told their audience some very amusing things of everyday life, and caused a great deal of laughter. Quenstedt, the geologist, and Veesenmeyer, the botanist, succeeded in rousing the merriment of the party to the highest pitch. On the 21st of September an excursion was made to Rottenburg, an ancient Roman town, and thence to the Niedernau, a modern watering-place. There were no less than 600 carriages, including cabs, omnibuses, and mail-coaches. In Rottenburg the naturalists were received by the Lord Mayor and Corporation. The principal street was most ingeniously ornamented; about 6000 hop-poles, with the graceful creeper around them, had been erected at suitable distances from each other, thus forming a complete avenue. The appearance they presented contrasted charmingly with the venerable old buildings, and the bright sun, the sweet smell of the hop, the flags and festoons, the music, the friendly faces of the inhabitants, the numerous huzzas, and the waving of handkerchiefs, formed altogether a scene of a very impressive kind. In Niedernau, where, after leaving Rottenburg and passing several villages, the carriages arrived, a good dinner was waiting, the President of the Society being aware that no one descended from Teutonic stock considers a festival complete without something substantial to eat. At dinner, the health of Uhland and Justinus Kerner was drunk. The presence of these two old poets, who have both endeared themselves by their patriotism to their countrymen, and have done so much towards making German literature what it is, called forth the greatest enthusiasm, which was the more real in a district which their writings have rendered classical ground, and where one cannot look at a ruin, or visit a town, that is not already associated in one's mind with some popular ballad or romance of these men. On the 23rd of September, an excursion was made to Reutlingen, formerly one of the free Rix-cities, but now a manufacturing town belonging to Wirtemberg. In the time of the last revolution, a great political meeting was held here, which gave rise to the fearful struggle in Baden. On the day mentioned, it presented a very peaceable appearance. On passing the boundaries of the town, the naturalists were received by two heralds on horseback, in the costume of the middle ages, both holding banners in their hands. The one was dressed in the colours of Reutlin-

gen; the other in those of Germany—black, red, and gold. Just outside the city gates there was a triumphal arch, and the cathedrals and all the steeples of the churches were profusely decorated with flags and streamers. The weather was beautiful. In one of the public gardens the dinner table had been spread in the open air, where at least 1500 people sat down. During dinner a well-conducted band kept playing. A fine effect was produced by a chorus of singers, consisting of peasants, both men and women, of the neighbouring district; they were all dressed in their native costume, and, headed by a fine-looking fellow of their party, who carried their banner, they marched around the table at which the naturalists were sitting. After dinner, most of the party paid a visit to the Achalm, the ruins of a castle mentioned in one of Uhland's ballads. The view from thence was charming. The vineyards surrounding the ruin, the town of Reutlingen, the rivulets, the distant chain of mountains, with its old feudal castles, formed a pleasing panorama, and amply repaid the exertions of those who, after taking in a hearty dinner, and letting the wine-bottle pass freely, had climbed the summit. In returning about eight o'clock in the evening to Tübingen, there was a firework on the top of the hill on which the castle is built. It produced almost a magical effect to see the old Gothic building illumined by the different-coloured fires, and the numerous rockets, with their blue, red, and white nuclei, shooting up into the sky. In short, there was plenty of amusement during the whole time of the meeting. Balls, concerts, dinner-parties alternated with each other; there was even once, so as as to give a notion of German-student life, a representation of a "Kneipe," in which grave professors, throwing aside for a while all reserve, acted the part of students and freshmen.

The scientific part of the meeting was equally satisfactory. In the three general or public sittings none but subjects treated in a popular manner were this time admitted, and all papers that could in the least offend the ear of ladies had been strictly rejected,—a laudable restriction, probably adopted in consequence of the complaints made by the press that medical subjects not intended for any but medical men had been brought forward. One of the first speakers was Jaeger, of Stuttgart, who gave a brief account of the last year's labours of the Imperial L. C. Academy of Naturalists, detailing that, as the first German institution, it had assumed the protectorship over the Societies of German Physicians at Paris and New York, that it had asked for three prize essays, and that the King of Wirtemberg had shown his good will towards the Academy by presenting it with a sum of money, to

be devoted to scientific exploring expeditions. Schultz, Bip., read an interesting paper 'On the Development of the Natural Sciences from the Middle of the Sixteenth Century until the Middle of the Nineteenth.' He assumed three periods:—1st, The period when knowledge was handed down by oral tradition; 2nd, When it was propagated by writing; and, 3rd, When perpetuated by printing. The present time he looks upon as the commencement of a fourth period, when, by the intimate international intercourse and the power of steam, knowledge is rapidly diffused. Dove, of Berlin, gave a comprehensive account of the present state of meteorology, and a very clear explanation of the causes which determine the weather of Europe. Carnal spoke on the importance of salt, gold, and coal,—three monosyllables playing an important part in the affairs of the world. He complained of the ignorance prevailing in England on the subject of German coal, and quoted a conversation he had with an Englishman of scientific standing, who asked him whether there were any coal in Germany?—a question he answered by stating that not only had Germany enough coal for her own use, but could supply England and all the world, at the rate coal is now used, for 500 years to come. Fraas gave an account of the oldest inhabitants of the Swabian Alps. It appears that a few years ago fossil teeth were found which some at once declared to be those of man. This determination, however, was called into question, as no human teeth of the mammoth period had ever been found in any part of the globe. Again, these teeth were exhibited last year in Wiesbaden, by Jaeger, when they were generally admitted to be human teeth; one was even sent to Owen, who agreed with the Wiesbaden meeting in pronouncing them to belong to man. The discovery of several almost perfect skulls has set the matter finally at rest: there was a race of men living simultaneously with the mammoth and other huge antediluvian animals. Gumbel read a paper on Mosses, explaining their importance in the economy of Nature, their great use to man, with whom they appeared together upon the earth. Veesenmeyer gave a spirited sketch of the Kirguises, and with a power of language reminding one of Humboldt's 'Views of Nature,' he described their relation towards plants and animals.

The sectional meetings were well attended. In the section for Chemistry and Pharmacology there were Fehling, Schlossberger, Leube, Babo, Weidenbusch, Ammermuller, Fresenius, Weltzien, H. Rose, &c.; Fehling and Rose alternately presided. In the section for Mathematics, Physics, and Astronomy, we noticed Wolfers, Osann, Reusch, Dove, Holtzmann, Gugler, &c.; Dove and Osann presided.

The section for Medicine and Surgery counted the largest number of members. We may mention Ritter, Virchow, Heyfelder, Erlenmeyer, Fraas, Vierordt, &c.; Virchow was elected President. The Botanical section counted amongst its members Martens, Veesenmeyer, De Bary, Steudel, Schnitzlein, Hochstetter, and elected Schultz, Seemann, and Gumbel Presidents. The section for Anatomy, Physiology, and Zoology was attended by Luschka, Ecker, Focke, Wutzer, and was presided over by Rapp. The section for Geology, Mineralogy, and Geography was represented by Carnal, Quenstedt, Strombeck, Glocker, Desor, Gerlach, Stocker, &c., and elected Merian President.

The Imperial L. C. Academy of Naturalists, which may be looked upon as the nucleus of the Society, held two sittings under the Presidency of Professors Jaeger and Heyfelder. Dr. Nees von Esenbeck, the President, was unfortunately prevented by illness from attending. In a letter of his addressed to Jaeger he gave a favourable statement of the affairs of the Academy, showing that there were at present a greater number of first-rate scientific papers for publication in the 'Nova Acta' than at any former period. The topics of discussion referred chiefly to the affairs of the Academy, and have not yet been made public.

On the 24th of September the meetings were finally closed. Göttingen was chosen as the place of meeting for 1854, and Professors Listing and Baum were elected Presidents of the Society.

According to the 'Bonplandia,' three Englishmen have, on the 18th of August, been elected Members of the Imperial L. C. Academy; viz., 1, John Smith, Esq., who received the cognomen "Kunze;" 2, Dr. Thomas Thomson, to whom the title "Hamilton" was given; and, 3, John Miers, Esq., on whom the name "Kunth" was conferred.

NOTICES OF NEW BOOKS, &c.

'*The Annals and Magazine of Natural History*,' No. 71, November, 1853. London: Taylor & Francis. Price 2s. 6d.

After an absence of any botanical papers since we last noticed this scientific journal, we have two in the November number. These are intitled:—

'On the Nuclens of the Characæ; by Al. Bratn;' being a translation by Mr. Henfrey.

'Note on the Parasitism of *Comandra umbellata*; by Asa Gray.' Extracted from 'Silliman's Journal.'

In North America, the genus *Comandra* replaces the European genus *Thesium*. After giving Mr. Mitten full credit for his important discovery of the parasitism of *Thesium linophyllum*, a full account of which was published in Hooker's 'Journal of Botany,' and in the 'Phytologist,' Dr. Gray goes on to describe a similar discovery as regards *Comandra*. "My esteemed correspondent, Mr. Jacob Stauffer, of Mount Jay, Lancaster county, Pennsylvania, has recently sent me fresh specimens of *Comandra umbellata* with its elongated and woody subterranean stems, giving off numerous roots, the branches of which are often expanded at their tips into a small tubercle or sucker, which is implanted by its disk-like surface upon the bark of adjacent roots, principally of shrubs. The foster plants in the specimens communicated, are blueberries and huckleberries (*Vaccinium vacillans* and *Gaylussacia resinosa*). Mr. Stauffer's specimens are accompanied by a neat drawing, illustrating the mode of attachment. This I would gladly forward for the engraver; but it will suffice perhaps for the present to say that the attachment is similar to that so clearly exhibited by Mr. Mitten, in the plate which accompanies his article; only that the rootlets in *Comandra* are from subterranean stems, and the suckers, so far as I have examined, do not appear to penetrate the foster root deeper than the surface of its wood.

"Since the above was in type I have received from Mr. Stauffer the announcement of his discovery of the parasitism of *Gerardia flava*, accompanied by a drawing which exhibits it, and a specimen which plainly shows the attachment. The numerous branches of the root are not only attached by disks or suckers to the bark of the root of the foster plant (in this case either white oak or white hazel), but are also implanted on each other, forming parasitical anastomoses."—*Silliman's Journal*, Sept. 1853.

The subject of root-parasitism, which has been established so completely in *Orobanche*, *Lathræa*, *Thesium*, and now in *Comandra* and *Gerardia*, and proof of which has hitherto so completely failed in *Monotropa*, is one of surpassing and absorbing interest. Decaisne is said to have detected it in *Pedicularis* and *Melampyrum*; but his conclusions have been the objects of some controversy, and much difference of opinion. It is well known to cultivators that all attempts to grow the Rhinanthaceous plants, otherwise than amid a host of

herbage which shall fill the soil with a network of roots, have proved utterly futile. How valuable, then, would be a carefully prepared paper on this subject, confined even to the British Isles, giving the result of a series of experiments, with the names of each parasite and its foster parent, and fully describing the mode and conditions of parasitism.

'Palm-trees of the Amazon, and their Uses. By ALFRED RUSSEL WALLACE.' London: Van Voorst. 1853. Post 8vo. 138 pp. Text, 48 Plates. Price 10s. 6d.

This is an admirable little book, creditable alike to the author and the artist. Mr. Fitch, long and favourably known as a botanical artist, has here excelled himself; his designs of the palms are really beautiful, and show how much may be done in a small compass. There is here an unusual combination of botanical accuracy with artistic and picturesque effect. Mr. Wallace is comparatively unknown as an author, but not as a naturalist. His sufferings and losses on board the unfortunate 'Helen,' having been detailed by himself, in a recent number of the 'Zoologist,'* have become familiar to all who take an interest in the well-being of those adventurous and energetic men who, as Natural-History collectors, have, during the last few years, added so enormously to our knowledge of the productions of distant countries. The object of the work before us is fairly and lucidly explained in the author's Preface, as below:—

"The materials for this work were collected during my travels on the Amazon and its tributaries from 1848 to 1852. Though principally occupied with the varied and interesting animal productions of the country, I yet found time to examine and admire the wonders of vegetable life which everywhere abounded. In the vast forests of the Amazon valley, tropical vegetation is to be seen in all its luxuriance. Huge trees with buttressed stems, tangled climbers of fantastic forms, and strange parasitical plants everywhere meet the admiring gaze of the naturalist fresh from the meadows and heaths of Europe. Everywhere too rise the graceful palms, true denizens of the tropics, of which they are the most striking and characteristic feature. In the districts which I visited they were everywhere abundant, and I soon became interested in them, from their great variety and beauty of form,

* Zool. 3641, No. CXIX.

and the many uses to which they are applied. I first endeavoured to familiarize myself with the aspect of each species, and to learn to know it by its native name ; but even this was not a very easy matter, for I was often unable to see any difference between trees which the Indians assured me were quite distinct, and had widely different properties and uses. More close examination, however, convinced me that external characters did exist by which every species could be separated from those most nearly allied to it, and I was soon pleased to find that I could distinguish one palm from another, though barely visible above the surrounding forest, almost as certainly as the natives themselves. I then endeavoured to define the peculiarities of form or structure which gave to each its individual character, and made accurate sketches and descriptions to impress them on my memory. These peculiarities are often very slight though permanent :—in the roots, the extent to which they appear above the ground ;—in the stem, the thickness, which in each species varies within very definite limits,—the swelling of the base, the middle or the summit,—its generally erect or curving position,—the nature of the rings with which it is marked,—the number, direction and form of the spines or tubercles with which it is armed ;—in the leaves, the erect or drooping position, the size and form of the leaflets, the angles which they form with the midrib, and the proportionate size of the terminal pair, are all important characters. The fruit-spike or spadix is either erect or drooping, either simple, forked, or many-branched ; and the fruits in closely allied species vary in size, in shape, and in colour, as well as in the bloom, down, hair or tubercles with which they are clothed.

“ In this little work careful engravings from my original drawings are given, with a general description of each species, and a history from personal observation of the various uses to which it is applied, and of any other interesting particulars connected with it. Several of the species here figured are new, among them is the palm which produces the ‘ piassaba,’ the coarse fibrous material of which brooms for street-sweeping are generally made.”—P. iii.

The following extract will show the universal use of palms by the Indian tribes, and their unspeakable importance to these primitive children of the forest.

“ Suppose then we visit an Indian cottage on the banks of the Rio Negro, a great tributary of the river Amazon in South America. The main supports of the building are trunks of some forest tree of heavy and durable wood, but the light rafters overhead are formed by the straight cylindrical and uniform stems of the Jará palm. The

roof is thatched with large triangular leaves, neatly arranged in regular alternate rows, and bound to the rafters with sipós or forest creepers; the leaves are those of the Caraná palm. The door of the house is a framework of thin hard strips of wood neatly thatched over; it is made of the split stems of the Pashiúba palm. In one corner stands a heavy harpoon for catching the cow-fish; it is formed of the black wood of the Pashiúba barriguda. By its side is a blowpipe ten or twelve feet long, and a little quiver full of small poisoned arrows hangs up near it; with these the Indian procures birds for food, or for their gay feathers, or even brings down the wild hog or the tapir, and it is from the stem and spines of two species of palms that they are made. His great bassoon-like musical instruments are made of palm stems; the cloth in which he wraps his most valued feather ornaments is a fibrous palm spathe, and the rude chest in which he keeps his treasures is woven from palm leaves. His hammock, his bow-string and his fishing-line are from the fibres of leaves which he obtains from different palm trees, according to the qualities he requires in them,—the hammock from the Mirití, and the bow-string and fishing-line from the Tucúm. The comb which he wears on his head is ingeniously constructed of the hard bark of a palm, and he makes fish-hooks of the spines, or uses them to puncture on his skin the peculiar markings of his tribe. His children are eating the agreeable red and yellow fruit of the Pupunha or peach palm, and from that of the Assaí he has prepared a favourite drink which he offers you to taste. That carefully suspended gourd contains oil, which he has extracted from the fruit of another species; and that long elastic plaited cylinder used for squeezing dry the mandioca pulp to make his bread, is made of the bark of one of the singular climbing palms, which alone can resist for a considerable time the action of the poisonous juice. In each of these cases a species is selected better adapted than the rest for the peculiar purpose to which it is applied, and often having several different uses which no other plant can serve as well, so that some little idea may be formed of how important to the South American Indian must be these noble trees, which supply so many daily wants, giving him his house, his food, and his weapons.”—P. 9.

If we turn from this comprehensive picture to either individual palm-portrait, whether of pen or pencil, we shall find it sketched with the same freedom of hand, and finished with the same painstaking care. Take, for instance, the following :—

Assaí (Euterpe oleracea). —“This species is very abundant in the neighbourhood of Pará, and even in the city itself. It grows in

swamps flooded by the high tides,—never on dry land. Its straight cylindrical stem is sometimes used for poles and rafters ; but the tree is generally considered too valuable to be cut down for such purposes. A very favorite drink is made from the ripe fruit, and daily vended in the streets of Pará. Indian and negro girls may be constantly seen walking about with small earthen pots on their heads, uttering at intervals a shrill cry of *Assaí-í*. If you call one of these dusky maidens, she will set down her pot, and you will see it filled with a thick creamy liquid, of a fine plum-colour. A pennyworth of this will fill a tumbler, and you may then add a little sugar to your taste, and you will find a peculiar nut-flavored liquid, which you may not perhaps think a great deal of at first ; but, if you repeat your experience a few times, you will inevitably become so fond of it as to consider ‘*Assaí*’ one of the greatest luxuries the place produces. It is generally taken with *farinha*, the substitute for bread prepared from the mandioc root, and with or without sugar according to the taste of the consumer.

“ During our walks in the suburbs of Pará we had frequently opportunities of seeing the preparation of this favorite beverage. Two or three large bunches of fruit are brought in from the forest. The women of the house seize upon them, shake and strip them into a large earthen vessel, and pour on them warm water, not too hot to bear the hand in. The water soon becomes tinged with purple, and in about an hour the outer pulp has become soft enough to rub off. The water is now most of it poured away, a little cold added, and a damsel, with no sleeves to turn up, plunges both hands into the vessel, and rubs and kneads with great perseverance, adding fresh water as it is required, till the whole of the purple covering has been rubbed off and the greenish stones left bare. The liquid is now poured through a wicker sieve into another vessel, and is then ready for use. The smiling hostess will then fill a calabash, and give you another with *farinha* to mix to your taste ; and nothing will delight her more than your emptying your rustic basin, and asking her to refill it.”—
P. 23.

Pashiúba miri (*Iriartea setigera*). — “ This species is of great importance to the Indian of the Rio Negro. With its stem he constructs his ‘*gravatána*’ or blowing tube, which, with the little arrows before described as made from the spines of the Patawá, forms a most valuable weapon, enabling him to bring down monkeys, parrots and curassow birds from their favorite stations on the summits of the loftiest trees of the forest.

"When he wishes to make a 'gravatána' he searches in the forest till he finds two straight and tall stems of the 'Pashiúba miri' of such proportionate thicknesses that one could be contained within the other. When he returns home he takes a long slender rod which he has prepared on purpose, generally made of the hard and elastic wood of the 'Pashiúba barriguda,' and with it pushes out the pith from both the stems, and then with a little bunch of the roots of a tree fern, cleans and polishes the inside till the bore becomes as hard and as smooth as polished ebony. He then carefully inserts the slenderer tube within the larger, placing it so that any curve in the one may counteract that in the other. Should it still be not quite correct, he binds it carefully to a post in his house till it is perfectly straight and dry. He then fits a mouth-piece of wood to the smaller end of the tube, so that the arrow may go out freely at the other; and when he wishes to finish his work neatly, winds spirally round it from end to end, the shining bark of a creeper. Near the lower extremity, he forms a sight with the large curved cutting tooth of the Paca (*Cælogenus paca*), which he fixes on with pitch, and the gravatána is then fit for use."—P. 39.

'*The Handbook of British Ferns.* By THOMAS MOORE, F.L.S., &c., &c., Curator of the Botanic Garden of the Society of Apothecaries, Chelsea, and Author of the 'Popular History of British Ferns,' &c., &c.' Second Edition. London: R. Groombridge & Sons, and W. Pamplin. 1853. 16mo. 232 pp. Text; numerous Woodcuts. Price 5s.

It is a difficult task to notice this work; but my voluntary offer on the wrapper of the last number compels me to do so. I have only one observation to make respecting it; and that is, that, although there can be no rational objection to one author borrowing an occasional sentence or idea from another, nevertheless he is bound, in manly candour, in common courtesy, to acknowledge the obligation. Now, Mr. Moore has throughout availed himself of my 'British Ferns,' not only without acknowledgment; but, as I think, without judgment. When I say without judgment, I mean to say that he has adopted the incorrect equally with the correct. Thus, my *correct* figure of *Trichomanes speciosum*, at page 315, and my very *incorrect* and unbotanical enlarged figure of a fragment of the same plant, at p. 316, are copied, without acknowledgment, at p. 201 of the 'Handbook.' Of

course the incorrect figure is omitted in my third edition; and so it will hereafter stand as Mr. Moore's own.

In instances, Mr. Moore has ventured to differ from me; but, whenever this is the case, he is obscure in his explanations. Thus, on the "dilatata group" he asserts, at p. 118, that *uliginosa* is *exactly intermediate* between *cristata* and *spinulosa*, and, at p. 131, that *glandulosa* is *quite intermediate* between *dilatata* and *spinulosa*; yet he asserts that *cristata*, *uliginosa*, and *spinulosa* constitute one species, and *dilatata*, *uliginosa*, &c., another; and, at p. 114, he says these two species are *readily distinguished*. This is as if a man should say that A and B are *readily distinguished* from C and D, but that D is *quite intermediate* between B and C. Like confusion occurs in the *Woodsi*s, &c.

I cannot object to this book as doing me an injury; I think it will rather excite a thirst for that more correct knowledge which, for sixteen years, I have been anxiously endeavouring to acquire, and which, from time to time, I shall do my best to make public.

EDWARD NEWMAN.

On Potamogeton flabellatus, Bab.

By CHARLES C. BABINGTON, M.A., F.L.S.*

IN the second edition of the 'Manual of British Botany,' I introduced a note to the effect that a *Potamogeton* inhabiting the canal near Bath would probably prove to be a new species, belonging to the group of which *P. pectinatus* is the type. It is there stated that "its dry fruit is semi-obovate compressed with 3 (?) obscure keels on the back;" and that its leaves have "transverse veins." The plant thus noticed was gathered by myself, so long ago as the year 1830; since which time I have scarcely ever visited Bath during the summer, and have thus had no opportunity of examining it in a living state.

In the interval between the publication of the second and third editions of the 'Manual,' I persuaded myself that the plant might safely be referred to *R. pectinatus* (still judging only from dried specimens in the flowering state), and therefore, in edition three, erased the remark that had previously appeared.

* Read at a meeting of the Linnean Society, Nov. 15, 1853; and communicated by the author.

In the first and second editions of the same book, there is also a plant described, under the name of *P. zosteraceus*, *Fries* ? which was very slightly known to me, it having been noticed in Hyde Park only.

In the year 1849, my attention was again directed to the plant, by Mr. Borrer informing me that Mr. Kirk, of Coventry, had shown him plenty of *P. pectinatus* and *P. zosteraceus*, *Bab.*, growing near to that city. An application to the latter botanist obtained for me a series of most characteristic specimens of it, and convinced me (as an examination of the living plants had previously satisfied Mr. Borrer) that it was specifically distinct from *P. pectinatus* and *P. zosteraceus*, *Fries*. Accordingly, in the 'Manual' (ed. 3) the name of *zosteraceus* is changed into *flabellatus*, a term derived from the usually fan-shaped habit of the flowering plant.

To revert to the plant found near Bath. In the month of July, 1853, I had occasion to spend some days at that city, and took advantage of the opportunity to endeavour to determine the doubtful pondweed. At that time there were no flowers nor fruit to be found, but abundance of barren specimens. Fortunately, their young state enabled me to decide with certainty that which might have been only a probability at a later period. Plenty of the earlier leaves, although much tending towards decay, continued to be attached to the plants; and thus it became quite certain that they belonged to my *P. flabellatus*. On re-visiting Bath in the month of October, 1853, I was equally unsuccessful in obtaining fruit or flowers, but saw an abundance of the broad leaves which are so characteristic of the species.

As the plant is apparently still but little known, a few notes, extracted from my observations upon it, may not be out of place.

There is a prostrate perennial rhizome creeping at the bottom of the water or in the mud, rooting at its joinings, and clothed at longish intervals with short, black, rather loose, clasping sheaths. From this rhizome spring solitary, long, floating stems, which are simple below, but become very much branched as they approach the surface of the water, where they spread in a more or less fan-shaped manner. They are very thick and strong in their lower part, not filiform like those of *P. pectinatus*.

The sheaths of the lower leaves are very large. Those leaves vary considerably in width, but may always be described as broad; they have 3, and sometimes 5, nerves, quite distinct from the edge, with transverse connecting veins. They do not at all resemble the leaves of *P. pectinatus*, which are formed of two conspicuous tubes, interrupted at intervals by transverse membranes, and separated by a

rather wide cellular space, forming the so-called central nerve. The supposed lateral nerves, also, are only apparent in that plant, being visible solely after the leaves have been subjected to pressure, and are merely the result of it. The lower leaves of *P. flabellatus* are of equal thickness throughout, and have their sides uniformly curved inwards so as to form a segment of a cylindrical tube; when dry, 3 or 5 rather prominent ribs are formed on the back, by the shrinking of the intermediate cellular spaces: their end is abruptly but shortly cuspidate. The upper leaves, including probably all those that float at or near to the surface of the water, are much narrower, and very gradually acute; 3-nerved, but the lateral nerves often so close to the margin as to be nearly undistinguishable from it.

It is probable that *P. flabellatus* was known to Hudson; for he has a plant named *P. marinus*, "Habitat in fossis maritimis . . . prope Sheerness abunde" (ed. 1, p. 63), "In insula Shepey abunde" (ed. 2, p. 77), which he supposed to be the *P. marinus*, *Linn.*: also that the plant found at Yarmouth, as noted below, is the *P. marinus*, *Huds.*; for Mr. Woodward is recorded (Wither. Bot. Arr. ed. 3, ii. 214) to have gathered what is so called by Withering at that place. Fries has shown (Novit. Fl. Suec. ed. 2, p. 52 and 55) that the name *P. marinus*, *Linn.*, refers rather to the *P. filiformis*, *Nolte*, than to either *P. pectinatus*, *P. flabellatus*, or *P. zosteraceus*. As the name has been employed to designate each of them, by one or more authors, it seems desirable to allow it to fall out of use, for its retention only tends to cause confusion. At all events, the *P. flabellatus* has no claim to be considered as the *P. marinus* of Linnæus, although it probably is that of Hudson and Withering.

P. flabellatus is found at Denver, Norfolk; in the canal near Bath, Somerset; Mr. Kirk meets with it near Coventry, Warwickshire; Mr. Syme, at Gravesend, Kent; the Rev. W. W. Newbould has brought it to me from the fen-ditches between Hull and Hedon, Yorkshire, and from near Burnham, Norfolk; it has been gathered by the Rev. Kirby Trimmer in salt-water ditches near Great Yarmouth; and it is recorded in the 'Flora of Hertfordshire' as growing in the river Lea at Hertford and Ware (p. 276), and in the canal near Tring (App. p. 17).

CHARLES C. BABINGTON.

November, 1853.

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